NATIONAL PETROLEUM NEWS

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A staff man from THE NATIONAL PETROLEUM NEWS is now stationed in the Texas fields with headquarters at Fort Worth to serve up the latest and most accurate news regarding developments in that district. Another staff man is at Tulsa watching developments in Oklahoma and Kansas. By telephone, telegraph and mail the news is gathered each week regarding operations in other fields in this country and Mexico. It is compiled by men who know the oil industry and served to readers while it is still "news"..... 29-40

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New Texas Fields Not A Menace

Possible Yield From New Districts Will Not Result In An Overprodoction Of Gasoline Crudes

Staff Special.
FORT WORTH, Feb. 7.

A SECOND reduction on credit balance prices for South Louisiana and South Texas (Gulf coast), heavy crude posted this week, brought the quotation for all grades except Spindletop to $1.25 a barrel and served to create a fear in some quarters of a reduction in the lighter oil districts. Spindletop production commands a price of $1.30.

Whatever else may enter into the situation as regards the lighter oil districts, two points stand out against the steady ebb of the Ranger development proving any considerable bugbear, according to seasoned students of the situation, who point out that there can be no repetition of the Cushing flood for the reason that operators do not drill deep wells to 3,200 to 3,500 feet on a declining market when a test costs a minimum of $40,000 and upwards as high as $60,000 to $75,000, measured by the amount of grief encountered and the delay in completing a well.

Again, it is pointed out, this time in an address by Dorsey Hagar, widely known and quoted as a petroleum geologist, before a class at the Southern Methodist University, Dallas, February 4th, that "Ranger has a sand body of ten to fifteen feet, so its potentiality as a producer is by no means as great as its large acreage at first leads one to believe."

Mr. Hagar's address at the same time sounded a warning to prospective investors that they should bear in mind in calculating possible dividends that the flow of oil from a well does not remain permanent, but lessens with the decline of gas pressure. He urged the necessity for conserving oil by careful drilling and the taking of steps to conserve rock pressure.

Life of Production Discussed

In discussing the quantity of oil contained in a producing sand, such as bears upon the potential production and life of the Ranger field, Mr. Hagar said:

"A sand body 100 feet thick with 20 per cent pore space in the sands contains the following amount of oil: 43,560x75x-20) divided by 42 equals 155,535 barrels of oil. A sand body ten feet thick with the same factors contains only 15,553.5 barrels. Of this amount, a fair average recovery will be 25 per cent of the total amount of oil, or 38,883 barrels for 100 feet, or 3,888 for ten feet. However, the average porosity is not so high, nor is the recovery as high as figured. Percentage of 15 per cent for porosity and 15 per cent for recovery are more conservative.

"Gas volumes must be allowed for, and as gas fills the sand as well as oil it must be considered. Ten to 20 per cent of the pore space may be filled with gas, so the amount of oil will be cut down by that amount. Some exceptional wells may drain surrounding areas so that the average production is far in excess of the normal. From 50,000 to 200,000 barrels per acre are known, but these productions are limited to but small parts of fields. At Cushing, Okla., 60,000 barrels per acre was produced on one lease; at Towanda (Kansas) one lease produced 40,000 barrels, but take the fields as whole units the production is not so high. In fact, 15,000 barrels per acre at Cushing and 8,000 barrels at Eldorado (in which district the Towanda pool is situated) are safe figures."

Various Pools Compared

In making a comparison of Ranger with other development, Mr. Hagar pointed out that "Cushing, Okla., forms a splendid example of dome structure. Glenn pool and Ranger are examples of terraces, though Ranger is complicated by a marked unconformity underground which puts it in a class by itself.

"All domes, anticlines and terraces do not produce oil. This must be clearly borne in mind.

"If all the beds were uniform in thickness and laid flat, any oil present would be disseminated throughout the beds in small quantities. What is necessary to cause accumulations of commercial importance is some condition that will localize the oil. Some sort of a trap is essential, and such traps are best formed by the folds formed in the strata of the earth's crust. This folding is due to the shrinking or settling of the earth's surface. Such folds vary in size from small folds a few inches in width and height to great folds that comprise whole mountains.

"It must be clearly recognized that oil fields occur on the flanks or sides of great uplifts. In Oklahoma and Kansas, the Ozarks and the Arbuckle mountains are the main centers. In Texas, the central mineral region, also called the Llano-Burnett uplift, is the center for north central Texas. The minor folds on the flanks of these uplifts produce the oil."

Burkburnett May Be Factor

With the Eastland-Stephens-Comanche county development (broadly termed the Ranger pool) making roughly 60,000 barrels daily, and Burkburnett production (south of the Oklahoma state line) reaching nearly 50,000 barrels a day, the latter district, it is pointed out by conservative operators, constitutes more of a menace than any other productive territory for the reason that with only one pipe line outlet, that of the Magnolia, there is danger of price-cutting on the part of promotion companies and small producers seeking to dispose of their crude quickly. Against this, however, is the argument that the high grade gasoline content and the "sweetness" of Burkburnett crude, has made it a highly desirable product for the Independent refiners who are paying premiums of 30 cents a barrel and shipping it to Oklahoma and Kansas refineries in tank cars.

One Kansas City refiner, who also owns an interest in a highly profitable Texas plant, is authority for the statement that he was able to make a greater profit off Burkburnett crude after shipping it by tank cars to Kansas City than he was able to do on Butler county, Kan., light crude. Another refiner, who has been running this crude thru his plant in southern Oklahoma, declared he had a recovery of 40 per cent gasoline, a good percentage of kerosene and a minimum of waste in addition to the fuel residue. This same refiner is authority for the statement that "it is criminal to skim Ranger crude, as analysis shows it to be the equal of the highest grade Pennsylvania oil when run down to all the products obtainable in a complete refinery."

Encouragement For "Wildcatters"

It is pointed out, too, that the great pipe line organizations, which have expended millions of dollars in building transportation facilities into the Ranger field will not overlook the quality of the production there obtained, and that with above ground storage depleted in the face of war demands over a period of some fifteen months they will not care to discourage development, such as any radical cut in credit balances for light oil would bring about.

Nor, were the major operating companies to be charged with mercenary intentions, would the reduction of credit balances redound to their benefit, since the greater part of Ranger production is controlled by them and the inevitable discouragement to result from a decline in crude oil prices would tend to lessen "wildcatting," which would narrow the testing out of vast acreage, which also it is cheaper for the major interests to allow to be "wildcatted" than it is for them to test out themselves.

Since their acreage extends over a majority of the counties in which tests are

under way, "checker-boarded" here and there in blocks taken over individually or operated as partnership with the Texas & Pacific Coal & Oil Company, it is pointed out there is nothing to be gained by a reduction in credit balance prices, and, until such time as the supply of crude overlaps demand, there is not seen by the seasoned operator any reason for a "scare."

Oklahoma Kansas Figures

It is pointed out, in this connection, that with Kansas production down to roughly 65,000 barrels daily, as against 130,000 barrels less than a year ago, and the nominal decline continuing in Oklahoma, there are no factors other than north central Texas (Burkburnett and surrounding development) and central west Texas (Ranger and contiguous territory) to figure.

While there have been isolated instances of big wells in Okmulgee county, Oklahoma, the big wells of Graham & Bird and the Carter Oil Company, near Nelogany, Osage county, and highly flush wells of the Sinclair Oil & Gas Company at Garber, the only Oklahoma development to forecast any considerable addition to the daily average totals has been Marland Refining Company deep sand well in the heart of the old Ponca City pool, where a maximum of 2,000 barrels, initial, came from a depth of 3,929 feet, probably in the Bartlesville sand.

The completion of the Marland well may be expected to result in deeper drilling in the northern districts of Oklahoma to the deep Bartlesville formation, and it is possible that the production to result therefrom may, in time, become a factor in the crude oil situation, tho it is pointed out that this is not a problem of the immediate future, and that before a thoro testing of the possibilities of deeper drilling can be made in this territory one of two things will have happened in Texas—either the broad sweep of potential acreage surrounding the Ranger district proper will have been proven up into a wide collection of pools with thousands of barrels of daily production, or its limits will have been closely enough defined to give the operator a fairer estimate of the possibilities of this area than is now considered possible.

Plans For Petroleum Congress At Chicago Are Taking Form

By Special Correspondent

CHICAGO, Feb. 10.—Details for the coming annual Petroleum Congress are rapidly taking shape and Secretary Reynolds is able to announce that Wilbur Nesbit, of Chicago, famed as poet and humorist, will be toastmaster at the banquet on March 27. Phillip Campbell, of Kansas, and a veteran member of Congress, will address the convention on March 26, on a legislator's viewpoint of the oil industry.

Congressman Campbell has achieved fame as an orator and his presence at the Congress portends much for the visiting oil men. The Tulsa Apollo Club is expected to be on hand to furnish entertainment for which it has a big reputation. The General American Tank Car Corporation has arranged to take the visiting oil men in autos to the Midway Gardens on the evening of March 26 for a dinner and high class vaudeville and cabaret entertainment. Delegates from Wichita Falls will come in a body, while Ft. Worth and Dallas have promised to send a representative delegation.

John D. Reynolds, secretary of the league, has the following to say regarding the coming convention of the organization:

From every oil section of America are coming assurances of the support of the Congress to be held in Chicago March 25th to 28th. With the problems confronting the industry daily assuming greater magnitude, the absolute necessity of some form of unity and concerted effort in their solution is inevitable.

"The attitude of the federal government in the Chicago rate war, evidenced by U. S. District Attorney Clyne's published statement that he would 'sift' the matter to the bottom," and if necessary interfere with the strong arm of National government, is but, in the minds of many intelligent oil men, a precursor of pregnant events. The seeming menace confronting over 400 small refiners throughout the country, as well as the business destiny of a host of jobbers and small dealers, will be obviated or removed by the action of this Congress.

"For all the leaders of the Standard, Sinclair, Texas, Roxana, as well as of the lesser, interests, are agreed that at this critical period of the history of the industry self-preservation would dictate that some plan must be formulated. The determined effort, now quiesent but always imminent, to place the entire industry under rigorous government control if not under direct ownership, can be met in but one way; the harmonization of warring elements in the industry. The pronunciamento has already been given frequently and forcibly to individual leaders, 'Get together or the Government will get you,'

"Interwoven with these problems are those of the oil leasing lands, embracing three million acres of what geologists unanimously aver to be potentially able to meet all demands of this Nation for decades to come. This too has been a matter of contention before Congress for nine years, the discordant claims having well nigh exhausted the patience of the national law makers. The presentation of this vital question by Max W. Ball, for ten years one of the chiefs of the government Geological Survey, will be followed by an open discussion.

"A message of great import to every oil man will be that of the Hon. P. P. Campbell, one of the half-dozen ranking Republican members of the new Congress, on the attitudes of the National Legislation on Oil. Campbell is one of the recognized orators of the Nation, with over twenty years' Congressional experience. and as he hails from the Mid-Continent field, is thoroughly familiar with the needs of the industry.

"The matter of railroad control, the needs and rights of the shipper will receive thorough elucidation. Experts in the various departments in this involved issue, will present their views. The matter of standardization of wastage, of a systematic appraisal of expenditure, in these times of governmental inquiry, will be presented and urged for acceptance. The imperative need of a great National Oil Institute similar in scope and power to the Steel Institute, is being urged by many leaders as the only feasible solution of the multitudinous problems. Given proper endorsement and clothed with powers somewhat beyond the purely advisory, it is held that an oil institute would, more than any single other agency, avert discord and maintain the now threatened independence of the industry.

"This Congress is to be not only one of counsel, but of cheer also. To that end there will be a banquet and music, and the many hospitalities which Chicago affords, and which the American Petroleum League and the local oil men are eager to extend their brothers. Also, their wives are hanging the latch string on the outside for the wives and mothers, sisters and sweethearts of the fellows in the game throughout the country.

"So the invitation is urged for every man having his own and the industry's interest at heart to come and lend his presence and best thought to make this the pivotal point in the history of oil."

North Texas' Biggest Doing 6,400 Barrels

Staff Special.

FORT WORTH, TEX., Feb. 11. — The Prairie Oil and Gas Company's Roper well, five miles west of Ranger, and a few miles south of the same company's Emma Terrell, was drilled 18 inches into the pay formation and came in making at the rate of 6,400 barrels a day. It had been previously making a small amount of oil from the top of the pay.

This is the largest well in the field, the Terrell having settled down to about 3,200 barrels.

The Joe Bartles No. 3 Gholson in proven territory is making 50 barrels at the top of the pay, the Texas Company's No. 5 Duffer 250 barrels, and the No. 7 Jone of the Humble Oil and Refining Company and Republic Production Company stood with 1,500 feet of fluid in the hole at 3,575 feet.

Humble Co. Increases Stock To $8,200,000

Staff Special.

FORT WORTH, Tex., Feb. 11. — The Humble Oil & Refining Company, at the meeting at Houston, Monday, authorized the sale of one-half the capital stock of the company, par value $4,100,000, for $20,000,000. Notices previously sent out to the stockholders asked for authority, which was granted, to increase the capital stock to $8,200,000, stockholders waiving all rights to its purchase.

President R. S. Sterling declined to make any statement in regard to the reports previously circulated that the Carter Oil Company was purchasing a half interest in these properties. If this develops later, it is said the purchase will not be by the corporation, as such, but by individuals. Rumors that the Standard of New Jersey has made offers to buy the entire holdings of the Texas and Pacific Coal and Oil Company in West Texas for roughly $100,000,000 are current but unconfirmed.

Would Eliminate Mid-Continent 'Lubs'

Railroad Chemists' Tentative Specifications Fail To Agree With Those Proposed By Oil Trade

By Special Correspondent.
WASHINGTON, Feb. 11.

SPECIFICATIONS for lubricating oil for use on American railroads that cut out products unless procured from a particular kind of crude, or that allow purchasing agents of railroads to call for car or coach-engine oils that can be furnished only by a favored company are to have no place in the standardized specifications for crude that are being prepared by the standardization committee of the Fuel Administration. That fact is made apparent by a circular letter sent to refiners and dealers in lubricants over the name of Director Requa. The letter is as follows:

"Several months ago Mr. A. C. Bedford, chairman, National War Service Committee, appointed a committee to represent the refineries of the United States. This committee met at the offices of the Oil Division of the Fuel Administration several weeks ago and made recommendations as to the specifications for certain oils which were to be used by the United States government, including the railroad administration. Last week a meeting was held at the Oil Division, of the committee representing the railroad chemists of the railroad administration. This committee also made recommendations as to certain oils to be used by the railroads. Accompanying this letter is a complete set of the specifications as recommended by the railroad chemists. On the attached sheet a comparison is given between the recommendations of the manufacturers and the railroad chemists.

"Valve Oil 'A,' is recommended for power plants and locomotive engines not using superheated steam. You will notice that the refiners recommended a minimum flash of 460 degrees, whereas the railroad chemists recommended at flash of 525 degrees. On Valve Oil 'B,' which is to be used on superheated engines, the refiners recommended a minimum flash of 500 degrees F., while the railroad chemists recommended 575 degrees Fahrenheit.

"If the recommendations of the railroad chemists be accepted, then it is only possible to make these oils from Pennsylvania crude, and this eliminates the manufacture of any of these oils from Mid-Continent crudes. The same thing follows on Valve Oil 'B;' that is, none of these oils can be made from Mid-Continent crudes.

"On Car Oils and Coach-Engine Oils, railroad chemists ask that a clause be added: 'The purchaser may further ask for heavy, intermediate or light summer oils, and divide them into these different classes according to gravity.' We feel that there should be no reference to gravity in the specifications, as gravity has nothing to do with the quality of an oil, and gravity only indicates from what crude it is manufactured.

"We would be glad to have your views and recommendations and criticisms on the recommendations, so that the same may be laid before the technical committee for their consideration in drawing the specifications. This committee will meet within the next three weeks, and at this meeting specifications will be adopted."

The gravity test, of course, enables a purchasing agent to call for a product that can be furnished only by a particular seller. The Fuel Administration has set its face against the use of this test. While the railroads were in the hands of their owners, the thought of the chemists that they wanted lubricants producel by certain companies and from certain kinds of crude may have been all right, but now that the cost of operating them is being borne, to a large extent by the public treasury, the central idea is that every man who can deliver the goods should be permitted to bid for the government's requirements.

The comparison between the recommendations of the refiners and the railroad chemists on various grades of oil required is as follows:

Valve Oil "A"	Flash	Viscosity	Fat
Refiners	460*	125–145	6–8%
R. R. Chem.	525	115–140	5–8
Valve Oil "B"			
Refiners	500	160–180	5–7
R. R. Chem.	575	170–195	4–6
Car Oil (Summer)	Flash	Vis. @ 210	Vis. @ 130
Refiners			
Heavy	300		275–300
Summer	275		175–200
R. R. Chem.	300	50–60	
Car Oil (Winter)			
Refiners	225		80–100
R. R. Chem.	225	45–55	
Coach-Engine Oil		Vis. @ 210	Vis. @ 100
Refiners			
"A"	300		450–500
"B"	225		200-250
R. R. Chem.			
Summer	325	60–75	
Winter	250	50–65	

*Min.

The tentative specifications for various grades of lubricants in railroad use proposed by the railroad chemists are as follows. Tests referred to are required to be made in accordance with the United States Railroad Administration standard code for testing lubricating oils:

Coach-Engine Oil

1. Scope. The oil is intended to be used for the journal box lubrication of all steam and electric locomotives and passenger train cars. It is also intended for use on side bearings, and for the machinery of locomotives.

2. Two classes of oil known as Summer-Coach-Engine Oil and Winter Coach-Oil, respectively, may be purchased. The purchaser shall in all cases state which class is desired.

3. Coach-Engine Oil will be purchased on approved samples submitted by manufacturers to the authorized agents of transportation companies.

4. Samples submitted for approval must comply with the following detailed requirements:

a. Gravity. The gravity of the oil shall not be under 18 degrees Beaume and not over 30 degrees Beaume. The purchaser may further ask for heavy, intermediate or light Summer or Winter Coach-Engine Oil, in which case the gravity of the heavy grade shall be not under 18 degrees Beaume, and not over 20 degrees Beaume, the intermediate grade shall be not under 22 degrees Beaume and not over 26 degrees Beaume, and the light grade not under 26 degrees Beaume and not over 30 degrees Beaume.

b. Impurities. The oil shall not contain more than 0.25 per cent of total impurities, including water.

c. Cold Test. The cold test of Summer Coach-Engine Oil shall not be higher than 32 degrees Fahrenheit, and of the Winter Grade not higher than zero degrees Fahrenheit, unless otherwise specified by the purchaser.

d. Flash Test. The flashing point of Summer Coach-Engine Oil shall not be lower than 325 degrees Fahrenheit, and of Winter Coach-Engine Oil not lower than 250 degrees Fahrenheit, when tested in the Cleveland Open Cup.

e. Viscosity. The viscosity of Summer Coach-Engine Oil at 210 degrees Fahrenheit shall not be under 60 and not over 75 seconds, and of Winter Coach-Engine Oil not under 50 and not over 65 seconds when tested by means of the Saybolt Universal Viscosimeter.

f. Tarry Matter. Coach-Engine Oil shall not yield over 0.1 per cent of chloroform soluble, tarry precipitate by weight. In routine tests the purchaser will have the option of accepting shipments which do not show precipitation in one hour.

g. Acid Test. The oil shall be neutral, not showing the presence of free acid or alkali when shaken with neutral water, using methyl orange and phenolphthalein, as indicators.

h. All of the tests detailed in this section shall be made in accordance with the U. S. R. A. Standard Code for Testing Lubricating Oils.

5. The manufacturer may furnish pure mineral oil or a combination thereof with non-drying fatty oils and lead soap.

6. Samples of oils meeting the above tests will be placed on the purchasers approved list.

7. When a sample has been approved, purchases may be made in accordance therewith. The corresponding product of any manufacturer of oil which does not produce satisfactory performance in service may at any time be removed from the approved list.

8. Purchasers may take samples of shipments of oil purchased on an approved sample in which case each sample will represent the contents of a tank, a car-load or fraction thereof. If tests on this sample do not agree with those obtained on the approved sample, such shipments may be rejected.

Car Oil

1. Scope. This oil is intended to be used for the journal box lubrication of all freight trains and work cars. It may be used for the lubrication of side bearings and journal boxes of locomotives, tenders and passenger train cars, and for the machinery of locomotives.

2. Two classes of oil known as Summer Car Oil and Winter Car Oil, respectively, may be purchased. The

purchaser shall in all cases state which class is desired.

3. Car Oil will be purchased on approved samples submitted by manufacturers to the authorized agents of transportation companies.

a. Gravity. The gravity of the oil shall be not under 19 degrees Baume, and not over 31 degrees Baume. The purchaser may further ask for heavy, intermediate or light Summer or Winter Car Oil, in which case the gravity of the heavy oil shall not be under 19 degrees Baume and not over 23 degrees Baume, the intermediate oil not under 23 degrees Baume and not over 27 degrees Baume, and the light oil not under 27 degrees Baume and not over 31 degrees Baume.

b. Impurities. The oil shall not contain more than 0.25 per cent of total impurities, including water.

c. Cold Test. The cold test of Summer Car Oil shall not be higher than 32 degrees Fahrenheit, and of Winter Car Car Oil not higher than zero degrees Fahrenheit, unless otherwise specified by the purchaser.

d. Flash Test. The flashing point of Summer Car Oil shall not be lower than 300 degrees Fahrenheit, and of Winter Car Oil not lower than 225 degrees Fahrenheit when tested in the Cleveland Open Cup.

e. Viscosity. The viscosity of Summer Car Oil at 210 degrees Fahrenheit shall not be under 50 and not over 60 seconds, and of Winter Car Oil shall not be under 45 and not over 55 seconds when tested by means of the Saybolt Universal Viscosimeter.

f. Tarry Matter. Car Oil shall not yield over 0.1 per cent of chloroform soluble, tarry precipitate by weight. In routine tests the purchaser will have the option of accepting shipments which do not show precipitation in one hour.

g. Acid Test. Oil shall be neutral, not showing the presence of free acid or alkali when shaken with neutral water, using methyl orange and phenolphthalein as indicators.

h. All of the tests detailed in this section shall be made in accordance with the U. S. R. A. Standard Code for Testing Lubricating Oils.

5. The manufacturer may furnish pure mineral oil or a combination thereof with non-drying fatty oils and lead soap.

Valve Oil For Power Plants

1. Scope: This oil is intended for use in the valves and cylinders of all stationary power plants using saturated or superheated steam. Locomotive Valve Oils of Class A may also be used for this purpose.

2. It will be purchased on approved samples submitted by manufacturers to the authorized agents of the purchaser.

3. Samples submitted for approval shall comply with the following detailed requirements:

a. Color. The color of the oil should be olive green. Shipments having a brown or blue cast or which are black may be rejected.

b. This oil shall be free from water and all other foreign substances.

c. Fatty Oil. The percentage of fatty oil shall be between 5 and 7. The fatty oil used may be neatsfoot oil, acidless tallow oil or prime lard oil, or mixtures of these. The presence of other fatty oils may cause rejection.

d. Acidity. The total acidity shall not exceed 0.4 per cent, calculated to oleic equivalent.

e. Tarry Matter. The test for tarry matter may be made on the original oil, or on oil which has been heated to determine its flashing point, or on both. The maximum amount of chloroform soluble tarry matter by either test shall not exceed 0.1 per cent by weight. In routine test the purchaser will have the option of accepting shipments which do not show precipitation in one hour.

f. Flashing Point. The flashing point shall not be under 460 degrees Fahrenheat, when tested in the Cleveland Open Cup.

g. Viscosity. The viscosity at 210 degrees Fahrenheit shall not be under 115 and not over 140 seconds when tested by means of the Saybolt Universal Viscosimeter.

Valve Oil For Locomotives

1. Scope: Two classes of oil may be purchased for this purpose, described as Valve Oil "A" and Valve Oil "B." The A class is intended for valves and cylinders of locomotives using either saturated or superheated steam, also for stoker engines and the steam and air ends of locomotive air valves, and shall be supplied by manufacturers in all cases where class B oil is not specifically ordered. Valve Oil B may be purchased for the lubrication of valves and cylinders and corresponding accessories of locomotives using superheated steam.

2. Valve Oil will be purchased on approved samples submitted by manufacturers to the authorized agents of transportation companies.

3. Samples submitted for approval shall comply with the following detailed requirements:

a. Color. The color of the oil should be olive green. Shipments having a brown or blue cast or which are black may be rejected.

b. Both classes of Valve Oil shall be free from water and all other foreign substances.

c. Fatty Oil. The percentage of fatty oil shall be as follows:

Class "A"	5-8
Class "B"	4-6

The fatty oil used may be neatsfoot oil, acidless tallow oil or prime lard oil, or mixtures of these. The presence of other fatty oils may cause rejection.

d. Acidity. The total acidity of Valve Oil "A" shall not exceed 0.4 per cent, and of Valve Oil "B" not over 0.3 per cent when calculated to oleic acid equivalent.

e. Tarry Matter. The test for tarry matter may be made on the original oil, or on oil which has been heated to determine its flashing point, or on both. The maximum amount of chloroform soluble tarry matter by either test shall not exceed 0.1 per cent by weight. In routine test the purchaser will have the option of accepting shipments which do not show precipitation in one hour.

f. Flashing Point. The flashing point of Valve Oil "A" shall not be under 525 degrees Fahrenheit and of Valve Oil "B" not under 575 degrees Fahrenheit when tested in the Cleveland Open Cup.

g. Viscosity. The viscosity of Valve Oil "A" at 210 degrees Fahrenheit shall not be under 115 and not over 140 seconds, and of Valve Oil "B" not under 170 and not over 195 seconds when tested by means of the Saybolt Universal Viscosimeter.

The membership of the railroad chemists' committee which met the Oil Division was as follows:

C. B. Young, U. S. R. A., and Oil Division, member ex-officio.

H. E. Smith, Assistant Engineer, U. S. R. A.

H. G. Burnham, Engineer of Tests, Northern Pacific R. R., St. Paul, Minn.

J. H. Gibboney, Chief Chemist, N. & W. Ry., Roanoke, Va.

N. F. Harriman, Engineer of Tests, Union Pacific R. R., Omaha, Neb.

B. D. Jennings, Chemist, N. Y., N. H. & H. Ry., New Haven, Conn.

C. E. Leaf, Assistant Engineer of Tests, C. B. & Q. R. R., Aurora, Ill.

M. E. McDonnel, Assistant Chief Chemist, Penna. R. R., Altoona, Pa.

J. O. Meyer, Chief Chemist, Great Northern Ry., St. Paul, Minn.

G. N. Prentiss, Chief Chemist, C. M. & St. P. Ry., Milwaukee, Wis.

J. C. Ramage, Superintendent of Tests, Southern Ry., Alexandria, Va.

T. D. Sedgwick, Engineer of Test, C. R. I. & P. Ry., Chicago, Ill.

C. P. Gundy, Chief Chemist, B. & O. R. R., Baltimore, Md.

Thus far the oil division has called into consultation a sub-committee of the Petroleum War Service Committee, composed of R. C. Holmes, vice president of the Texas Company; C. E. Graff, of the Standard of New Jersey; H. S. Morton, of the Standard of Indiana; H. Maitland, of the Sun Company, and P. H. Conradson, of the Galena Signal Oil Company, representing the manufacturers.

This making of specifications for the lubricating oil to be bought for government use is to be in obedience to the president's order of July 31st last, issued to avoid duplication of effort by the different branches of the government to find out what kinds of oil they need, where and when to obtain them "and in the interest of economy and the more efficient concentration of the government and the better utilization of resources and industries."

Captain Lipsner Is Eager To Cross Ocean

CHICAGO, Feb. 8. — Capt. B. B. Lipsner, well known in the oil industry as an auto-truck expert and from whose pen has appeared a series of articles in the NATIONAL PETROLEUM NEWS, is also famed for his expertness in aeronautics and in this latter connection he has placed a bet that he will be the first one to cross the Atlantic in an airplane in 1919.

Captain Lipsner was aroused to this action by a challenge issued by Lieutenant David H. McCullough, a New York aviator, that the latter would be the first one to cross the pond this summer and had placed a wager of $10,000 to back his assertion. Upon learning this Captain Lipsner late this week wired Allen R. Hawley, of New York, president of the Aero Club of America, to this effect:

"Answering McCullough's challenge, I will bet him $10,000 that he won't be the first to cross the Atlantic. I will also give him $10,000 to get the No. 1, so that I can make the trip. If he does I will bet him another $10,000 I will cross the Atlantic within 30 days after I get that ship. Am wiring Max Miller to be ready. This is a real bet. Certainly the Atlantic will be crossed in 1919 but not by an American unless we wake up."

Requa Will Submit To Trade Plan To Stabilize Light Oil Markets

By Special Correspondent.

WASHINGTON, Feb. 11.—A definite, understandable, and, it is believed, workable scheme for the stabilization of the price of gasoline, or any other petroleum product that may hereafter show itself as a disturbing factor in marketing conditions in this country will be laid before the industry by Oil Director Requa in a short time, possibly less than a month.

The Chicago rate war, however, is not the immediate cause for the formulation of this scheme. The fact that there is a price cutting war in that city, it is believed, will cause the industry to study the suggestion with greater interest, however. It will be an object lesson as to what may be avoided if such a plan as that being considered can be made effective. The price cutting will give point and force to the ideas put forth in connection with the data that has been collected and will be made public.

One of the most interesting facts in the whole matter is that the Standard interests generally are as much concerned about the price cutting and anxious to avoid it in the future as the non-Standard. Another is that the wide variations in price in markets controlled by the Standard, or supposed to be under its domination, is the thing that called the sharp attention of the Fuel Administration to the present price situation. It was the wide variation of prices in territories where the Standard is strong that caused Dr. Garfield to suggest there might be a reduction in the price of gasoline. His remarks were interpreted by the newspapers at the time they were made to mean a horizontal reduction. He meant merely reductions to bring prices into better relationship.

Requa's Statement

Specifically answering the question as to whether the price stabilizing work of the oil division has any immediate bearing on the price war raging in Chicago, Director Requa said:

"The Fuel Administration has no price-fixing powers under the Lever Bill. It has, however, accomplished during the war period a great deal by securing the voluntary co-operation of the industry.

"It has been engaged for some time and is now engaged in a study of prices and hopes soon to submit the study for the information of the industry. Letters have been exchanged with several prominent oil men in an effort to discover what was wrong and how it could best be corrected.

"There has been no final conclusion reached as yet."

No matter what either Dr. Garfield or Director Requa thinks about the price war in Chicago, they are powerless to prevent it. The Lever law, under which the President created the Fuel Administration, gives no price-fixing power. By inference, many have supposed that it does. That is to say, to accomplish a definite result, they have believed that Dr. Garfield could say to a given unit of the industry that if it did not quit doing a certain specified thing, as, for instance, selling gasoline at point A for 23.5 cents, while selling it for 22 at point B, its license would be revoked.

As pointed out in the NATIONAL PETROLEUM NEWS, the basic idea in the price regulating or stabilization studies of the oil division is and has been that there is a relationship of prices determined by the cost of production in each of the refining districts and that when the price at a given point in any one of the districts varies from what might be called the base price in that district, by more than the cost of transportation to the point in question, artificial conditions are created.

For the purpose of illustration, suppose a reasonable price for gasoline at Tulsa is 22 cents and the cost of getting the stuff to Columbia, Tenn., is two cents a gallon, while the cost of getting it to Columbia from Baton Rouge is only 1.5 cents per gallon. Then if the price at Columbia were 25 cents, obviously it would be out of line at least one cent, because the maximum transportation cost is only two cents, the cost from Baton Rouge being a half cent less.

It is not known, but it is believed, the scheme in formulation by Director Requa is a combination of railroad rate-making and price-making such as exists in the steel industry. In the last mentioned industry, Pittsburgh is the Alpha and Omega of price-making. Prices everywhere are based on Pittsburgh. The freight rate from Pittsburgh to the destination of the steel is either added or deducted from the price quoted by a mill no matter where it is situated. Raw sugar and cotton are priced in much the same way, cotton being off or added to Liverpool, New Orleans, New York or Memphis prices.

Divided In Districts

In the oil industry, so far as a superficial view discloses, there are five or six places in the country where there is a base price for a given territory, analagous to the base rates for rail transportation. The various Standard companies have divided the country into districts, but their prices bear no relation, in many instances, to the base price at the refining center in the district. Transportation cost, for instance, cannot be the factor of difference between Ohio and Indiana because the transportation rate is not as great as the difference.

Having no power to fix or modify prices, it follows that when the oil division submits its study, and by implication points out how the prices may be stabilized so that units in the industry that are reasonably well established and well managed may make a living, nothing can be accomplished unless the units in the industry take the basis suggested and adhere to the principles that may be indicated in the studies. That means that unless those having the power to make the price at Columbia, Tenn., (getting back to that simple illustration) make the price there not more than twenty-four cents when the reasonable price at Tulsa is twenty-two cents, nothing will be accomplished. The men in the industry must act on the assumption that they can kill each other but that it is of no benefit, either to themselves or to the communities they serve, to commit commercial murder.

Under the federal trade commission law, a difference in price other than that created by the difference in transportation cost, is made prima facie evidence of unfair methods of competition. The trouble with that law is that it does not recognize the fact that units in a given trade cannot be forced to compete. In other words, while there is a difference between Standard prices in Ohio and Indiana greater than the cost of transportation, it cannot be held to be a violation of the Standard of Ohio.

There may be a discrimination in price in the fact of such variation, but it is a discrimination that cannot be condemned as unlawful because, the courts having dissolved the Standard combination, the price made by the Standard of Ohio cannot be made the test of prices made by the Standard of Indiana.

Chicago Jobbers Put Grievance Before Federal Trade Commission

By Special Correspondent

CHICAGO, Feb. 11.—The action started by a committee of the small jobbers marketing gasoline here to bring about an investigation of the present price situation by the United States District Attorney's office has resulted already in a committee from those jobbers making the trip to Washington to place their side of the case before the Federal Trade Commission. It is pretty generally known that this committee left Chicago several days ago. Just what individuals made up that committee is being kept secret as yet.

The jobbers who took their grievance to District Attorney Clyne charged collusion between the Standard of Indiana, the Texas Company and the Sinclair Refining Company, the three larger marketing organizations here, to put them out of business. Their action came about thru the price tactics indulged in during the past few weeks by the Texas and the Standard, the Texas putting into effect again the garage differential eleminated by the Standard last fall, and the Standard thereupon putting into effect a quantity-fill price which it allows to consumers as well as reselling agents, thus bringing the level of the tank wagon market down two and a half cents.

Because of a press of other matters and in order to have more time to make a study of the question District Attorney Clyne has asked the complaining parties to make written statements embodying their complaints, but it has not been definitely learned whether they followed his suggestion. The main proof relied upon to show that one company was forced out of business here is said to have been thrown out of the evidence by Clyne by reason of the fact that he ascertained that for more than a year this company has been attempting to dispose of the filling station branch of its business, it having been only a question of time when such a transaction would have been consummated. The closing out of the business at the time of the price reduction by the Standard was an event not unexpected.

On the other hand the alleged big three are not going to sleep. "We believe we can show with little trouble that these same fellows who have complained against us have in the past few years

practiced the same tactics of which they accuse us," said a representative of one company. "They have not held to the price—they have made cuts right and left and have taken away some of our best customers by allowing ninety days' time where we had allowed thirty. They would allow a discount of one, two or three per cent per gallon off the regular prices. We know of one instance where a certain superintendent of a company using quantities of gasoline has regularly been paid a salary, as it were, monthly by one of the complainants so that the latter would be assured of retaining the business. We know who has been bought new hats, presented with boxes of cigars and the like so that the business might be retained. We are collecting all this sort of evidence possible and when we go into the investigating chamber, if we are called, we are going to show up a few things that have been done by these complainants in violation of fair business methods."

Said another man: "These complainants have got what they were playing for. They have been cutting prices by offering rebates, making presents, etc., and this was fine business for them as long as the price stayed high. Now, when there is so little difference between the retail and wholesale price they have reached the point where they can't cut or give rebates any more and, being up against it, naturally they are hollering. My business here has suffered greatly by the tactics of these men and as far as I am concerned I am content to sit still and let them holler. The situation is the best in four years and I shall be glad to see it remain as it is now. Competition, as far as I am concerned, is on a better basis than it has been for years. These fellows have got what is coming to them."

C. L. Maguire, president of the American Petroleum League, before his departure for the coast on Friday night, declared that all that can be done in the matter is being done. He said that the present situation is not nearly so serious as it will be when the demands of early spring business cause an increase in refinery prices, for then undoubtedly the small fellows will get badly hurt. But, he declared, his association was going ahead doing its best to find a remedy for the situation and be prepared to face such situations in the future, believing that if an agitation is started now it will probably head off a worse situation later on.

Imports Increased

The monthly summary of foreign commerce for November, 1918, as compiled by the Bureau of Foreign and Domestic Commerce, Department of Commerce, shows that 182,308,500 gallons of crude were imported into the United States for that month, as compared with 88,546,563 gallons, imported for the same month of the previous year. The value of the November 1918, imports of crude was $2,213,095, as compared with $1,135,975 in November, 1917.

Refined products, exclusive of gasoline, benzine and naphtha, were imported to the extent of 6,526,444 gallons in November, 1918, as compared with 3,570,439 gallons for the same month in 1917. The November, 1918, imports of refined products were $428,394, an increase of $254,616 over the same month in 1917.

Action Of Senators May Work Injustice To Many Oil Producers

WASHINGTON, Feb. 10.—Millions of dollars in excess profits taxes will have to be paid, unjustly it is believed, by oil producers, especially those who participated in the discoveries in the Eldorado and Augusta fields, on account of what the conferees on the war revenue bill did to that measure at their last meeting, which action was endorsed by the House of Representatives on February 8. The conferees changed the "depletion allowance" period from twelve to thirty days.

The conferees, whose meetings were secret, took that action, it is understood, at the meeting on February 5. They reported what they had done two days later, thereby dumbfounding Judge Shea, J. Harry Covington and others of the committee representing the producers, who have been in Washington all winter trying to get a decent provision for depletion allowance on oil and gas wells.

In the provisions relating to the income taxes for individuals and corporations and excess profits taxes, the Senate wrote language saying that the valuation should be made for tax purposes, either on the date of discovery, or "within twelve months thereafter." That meant that the taxing should be done upon what might be called the normal performance of a well.

That change means millions of taxes to be paid by the Doherty interests and interests situated like them. The conference report recommending such a change has not been adopted by the Senate.

About the only hope is that Representative Kitchin, by language used by him in the House of February 8th, will have angered Senators to such an extent that they will not agree to the conference report, even if their failure to accept it will throw the measure into the next Congress, which will meet in extraordinary session, some time in May or June.

Kitchin told the House that the oil men had bamboozled the Senate. He would not stand for such a reduction in taxes upon the oil producers, he said, because they have been given enough consideration by the House. In the old days, when the Senate was a body that acted as a check upon such radicalism as is typified by Kitchin, the use of the word "bamboozled" would have been enough to cause a check by the Senate until there could be a good airing.

The bill as agreed upon by the conference committee, and as endorsed by the House on February 8, says that in computing net income "there shall be allowed as deductions" from the amount on which the income and excess profits taxes are to be deducted, amounts for depreciation, losses, obsolescence and things like that. In ascertaining what deductions are to be allowed on oil and gas wells the provision as approved by the conferees and the House, is as follows:

"In the case of mines, oil and gas wells, other natural deposits, and timber, a reasonable allowance for depletion and for depreciation of improvements, according to the peculiar conditions in each case, based upon cost including cost of development not otherwise deducted: Provided, That in the case of such properties acquired prior to March 1, 1913, the fair market value of the property (or the taxpayer's interest therein) on that date shall be taken in lieu of cost up to that date: Provided further, That in the case of mines, oil and gas wells, discovered by the taxpayer, on or after March 1, 1913, and not acquired as the result of purchase of a proven tract or lease, where the fair market value of the property is materially disproportionate to the cost, the depletion allowance shall be based upon the fair market value of the property at date of the discovery, or within (12 months) thirty days thereafter; such reasonable allowance in all the above cases to be made under rules and regulations to be prescribed by the commissioner with the approval of the secretary. In the case of leases the deductions allowed by this paragraph shall be equitably apportioned between the lessor and lessee."

That provision is put into the bill three times, so as to cover the various kinds of taxes, individual, and corporate ordinary income and excess profits.

As agreed upon in conference and accepted by the House, the war revenue bill increases the tax on transportation of oil by pipe line from five to ten per cent.

Lewis Selected To Fill Naramore's Position

WASHINGTON, Feb. 11.—J. O. Lewis, superintendent of the petroleum experiment station at Bartlesville, Okla., has been appointed chief petroleum technologist of the Bureau of Mines in place of Chester Naramore, who resigned to join the Union Petroleum Company, Philadelphia, Pa.

Mr. Naramore joined the petroleum division of the Bureau of Mines September 26, 1916, and on January 1, 1917, was placed in charge of the entire petroleum work, succeeding W. A. Williams.

In addition to being the executive officer of the petroleum division during a time of war when the demands on the petroleum industry were larger than ever before, Mr. Naramore saw overseas service as a representative of the United States Shipping Board and Fuel Administration, and held conferences with the allied nations at London, Paris and Rome on an adequate supply of petroleum for all the allies.

Mr. Lewis, his successor, is a graduate of Stanford University in the class of 1909. After graduation he worked in the geologic department of the Associated Oil Company of California, during which time he made a study of the oil operations in the California field, as well as in the Calgary fields of Canada during 1914. Mr. Lewis came to the government service on October 1, 1914, and served as oil and gas inspector at Muskogee, Okla., for one year. After that he was transferred to the Bureau of Mines staff, where he continued his investigations in behalf of the industry. On January 1, 1918, he was transferred as superintendent of the petroleum experiment station at Bartlesville, which position he held until his appointment as chief petroleum technologist. He is the author of a number of publications of interest to the petroleum industry, such as Bulletins 134, "The Use of Mud-Laden Fluid In Oil and Gas Wells," and 148, "Methods of Increasing the Recovery of Oil From Wells," and Technical Paper 130, "Underground Wastes In Oil and Gas Fields and Methods of Prevention."

Co-operation To Solve Motor Fuel Problem

Auto Engineers In Accord With Oil Men That Shortage Threatens Unless Supply Is Conserved

Staff Special.
NEW YORK, Feb. 7.

THE motor fuel of the future—the extent of its supply and its chemical makeup—was discussed at the Thursday session of the Society of Automotive Engineers held this week in the Engineers Societies' Building. The papers delivered at this session, with the exception of a talk given by President Charles F. Kettering of the Society, were given by representatives of the oil industry, talking from the point of view of the oil industry. Several from the oil industry were present to hear the addresses. The session was unique in that it was the first time in the annals of the automotive engineers that the oil industry has been represented on the program at one of its annual meetings.

The outstanding feature of the motor fuel session was the accord in which the automobile engineers, as far as can be determined, and the oil trade view the motor fuel situation. Some from the oil trade have been of the opinion that the automobile makers were not alive to the enormously increasing demand for motor fuel that is taxing the refineries of the country; that they were interested only in the development of the internal-combustion engine from a mechanical viewpoint and that, having produced the engine, they left it entirely to the refiners to find the fuel on which they should operate. Such is not the case, however. These are the words of President Kettering along this line, delivered in the course of his address:

"We have got to make the motor fuel question our vital problem whether we want to or not. We must take practically what the oil men give us and develop internal-combustion engines that will use it satisfactorily. The entire future of the internal-combustion engine depends on the satisfaction we give its users. We must think in terms of the fuel question from an efficiency standpoint. We have got to get a higher degree of thermal efficiency as our contribution to conserving this country's oil resources. The motor fuel problem will be solved by co-operation between the engineers and the oil men."

Co-operation Urged

In developing the point of securing greater co-operation between the oil trade and the automotive engineers, President Kettering suggested some form of bureau of petroleum technology in which the engineers, oil chemists, and such government bodies as the Bureau of Mines, Bureau of Standards and the Geological Survey could all work together towards the common end of securing a supply of motor fuel that would meet the demand that will develop the next few years.

The various phases of the motor fuel situation discussed at the session included the nation's available supply of crude in the ground; the nature and extent of Mexico's crude petroleum resources; the development of refining practice to allow a larger proportionate yield of gasoline from the crude; the more efficient regulation of temperatures within the cylinder to allow the use of heavier fuels; better carburetion and ignition devices, and others. The future of oil shale distillation was touched on briefly and the observation was made by President Kettering that the manufacturers and distributers of the fake gasoline tonics must be put out of existence as the fulfillment of one duty his society owed the public.

The principal speaker on the program as representing the oil industry was Dr. Joseph E. Pogue, assistant director in technical matters in the Bureau of Conservation of the Oil Division. In fact, the motor fuel session was arranged largely at the request of Dr. Pogue, who stated in a letter to President Kettering the advisability of laying all the facts in the situation before the automotive engineers, inasmuch as the oil trade felt the use of internal-combustion engines was developing more rapidly than the country's capacity to provide gasoline. Dr. Pogue is not as well known to the oil men of the country as he should be, it was felt by those from that trade who attended this session. He is a scientific investigator in the Bureau of Mineral Technology in the National Museum, who has been temporarily assigned to the oil division of the Fuel Administration. In a paper entitled "An Interpretation of the Motor Fuel Situation," Dr. Pogue brought to the attention of the engineers the conclusion that the supply of motor fuel is in course of change at present in both character and price, with the danger of precipitant changes as regards both factors. He developed these facts:

"That the domestic production of crude petroleum is nearing its maximum."

Full Report of S. A. E. Motor Fuel Session

With the exception of a highly interesting talk given by President Charles F. Kettering, of the Society of Automotive Engineers, the addresses given at the motor fuel session of the engineers' meeting in New York last week dealing with the gasoline situation from an oil man's viewpoint are given in the following pages of this issue in full.

President Kettering's talk was given impromptu, and took up problems of carburetion and combustion from an engineer's standpoint. It should prove interesting and of value to the oil trade, however, and will be published as soon as copies are available.—Editor.

"That the natural gasoline content of this supply is lessening.

"That Mexico promises no relief competent to solve the issue.

"That substitute motor fuels introduce no new conditions that need be taken into account.

"That the supply of motor fuel can be maintained only thru an extraordinary dependence upon cracking processes or thru changes in motor types.

"That cracking, unaided by adaptations in motor types can scarcely meet the issue with the maintenance of a favorable price and that the burden therefore falls upon the automotive engine, which must consequently adapt itself to gain higher thermal efficiency on less volatile fuels."

The resources of crude petroleum underground in this country and Mexico were discussed by Dr. David White, chief geologist of the U. S. Geological Survey, in a paper entitled "The Unmined Supply of Petroleum in the United States."

Dr. White showed that four separate estimates had been made in the last few years as to the supply of crude petroleum remaining underground in this country; that these estimates were in pretty general accord and that the most recent estimate placed the figure as of January, 1919, at 6,740,000,000 barrels. Since 1858, Dr. White went on to show, 4,598,000,000 barrels of crude oil have been taken from the ground, more than two-thirds as much as is now available, and that that reserve is being drawn on at the rate of about a third of a billion barrels a year. Furthermore, he stated, although most intensive drilling has been carried on in the past ten years the net estimate of crude underground has not been increased.

Peak Production Reached

Dr. White gave it as his opinion that the peak of production of crude in this country will be reached by 1921. "The situation demands not only the prevention of waste but the most economical and efficient use of our oil," he stated.

As regards Mexico, Dr. White, in discussing briefly the nature of petroleum deposits there, stated their supply may be less than remains underground in this country. A paper was also given dealing directly with the nature and extent of petroleum deposits in Mexico.

The possibilities of more efficient refinery practice adding to the future supply of motor fuel was discussed by Dr. E. W. Dean, of the Bureau of Mines, in a paper called "Status of Refinery Practice with Regard to Gasoline Production." He stated the wider use of cracking processes was the most promising means by which refiners could increase their output of gasoline from a given supply of crude, and that the Bureau believed that a wider use of cracking processes might permit of further increases up to possibly doubling present production.

The automobile engineers during their stay in New York were extended an invitation by the Tide Water Oil Company, thru President R. D. Benson, to visit their refinery at Bayonne and see first hand the manufacture of lubricating oils.

Interpretation Of Motor Fuel Situation

An address delivered by Dr. Joseph E. Pogue, assistant director in technical matters, Bureau of Oil Conservation, Oil Division, Fuel Administration, before the motor fuel session of the Society of Automotive Engineers in New York, February 6th.

THE principal factors in the motor fuel situation are the demand for motor-fuel and the adaptability of the internal combustion engine, on the one hand; and the supply of crude petroleum, the gasoline-producing capacity of this material, and the substitute fuel in sight, on the other. Out of the interplay of those factors will come developments, focused in the price of motor-fuel, that will determine the future of the automotive industry.

The demand for motor-fuel has been increasing over the past few years at an imposing rate. The nature of this expansion is shown graphically in an accompanying diagram. The construction program of automotive manufacturers, moreover, affords no prospect of let-up in the pressure of fuel requirement; on the contrary, the injection into the situation of a notable development in the capacity for truck production introduces an element that bids fair to overshadow even the tremendous automobile demand, while the item of tractor manufacture, looms ahead with a fuel significance scarcely second in importance. If these matters be projected into the future unabated, it is evident that the supply of motor-fuel will be called upon to double every few years. The automotive industry is young and vigorous and its continued expansion will place an unexampled burden upon the motor-fuel resources of the country.

The Adaptability of Motor Type

The automotive engine has developed and become standardized in its main features on the basis of cheap and volatile gasoline. Its improvement has mostly followed the direction of convenience and performance, with secondary consideration to fuel economy. This trend has been sustained to the present by the existence of a highly stimulated oil production, providing gasoline capacity in excess of gasoline demand. So long as this condition obtained, there was no need for the automotive industry to concern itself with considerations of fuel supply. But now, with the gasoline capacity of the country beginning to give indications of strain, while the gasoline demand is just fairly getting launched, the question arises as to whether the exigencies of the future will allow the motor type continued freedom of development in luxury directions, or will force adaptations to meet the exactions of the fuel situation.

The automotive apparatus is mechanically responsive to changing requirements, but its adaptation to new conditions is retarded by the time required to perfect mechanical developments and the counter advantage to be gained from quantity production and standardization with their antagonism to change. So far-reaching and insistent, indeed, are the claims in favor of holding fast to established standards, that departures can be made only at great cost and in response to powerful reasons. Anticipatory action becomes peculiarly difficult in the face of these circumstances. Recognizing the strength of the forces disfavoring changes in motor-type and seeking to force the fuel supply into channels fitting the established standards, we may examine the fuel supply with a view to determining if present motor standards can be advantageously maintained, and, if not, the directions that changes will follow.

Supply of Motor-Fuel

The motor-fuel in dominant use in the United States is gasoline, a mixture of volatile liquids won from crude petroleum by a process of distillation. Kerosene, fuel oil, lubricants, and various by-products are produced at the same time, and bear an intimate relation to gasoline, both as to proportion and price. The quantity of gasoline that the country is capable of producing depends upon the supply of crude petroleum and the gasoline capacity of this material.

The supply of crude petroleum for the years to come depends upon the unmined reserve and the rate at which it may be won. The reserve in the United States has been inventoried by the U. S. Geological Survey in 1908, in 1915, and again in 1918, with results shown in an accompanying chart. The significant aspects of the results are two: the small size of the reserve, approximating seven billion barrels in 1918 (our annual production is over one-third billion), and the fact that in the past ten years, in spite of an exceedingly aggressive campaign of oil exploration, the decrease in the reserve has exceeded the addition to the reserve thru new discoveries. Those, therefore, who count upon new discoveries to materially affect the basic situation overlook the fact that for ten years already discoveries have been failing to do so.

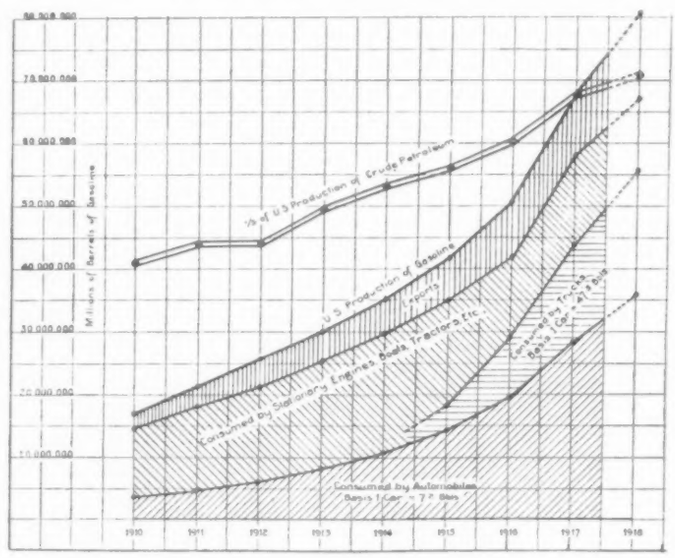
At the same time the production of crude petroleum has been steadily mounting to its present enormous figure. This growth in output has been sustained, not primarily by the discovery of new oil-fields, but largely by the cumulative tapping of an increasing number of rich spots in inventoried territory. There is obviously a limit to an output supported by such a train of circumstances; there are strong engineering and economic reasons for believing that the output of crude petroleum in the United States is nearing its maximum and the country will soon pass into a period of slowing and more costly production.

The Gasoline Factor

The output of gasoline approximates the supply of crude petroleum multiplied by its commercial gasoline factor.

The commercial gasoline factor is here used to represent the percentage of gasoline obtained from the crude consumed, the natural gasoline factor is the percentage of gasoline contained in the crude consumed. The first has increased until it has overtaken the second. The terms are used in a general sense.

At the present time this factor is about 20 per cent. This factor, like the supply of crude petroleum, is itself a variable figure depending upon the proportion of the crude supply subjected to refining, the natural gasoline content of this quantity, and the extent to which means are used for forcing the



The gasoline situation. This composite chart is drawn from data as follows: Crude production from U. S. Geological Survey; gasoline production from U. S. Fuel Administration and U. S. Bureau of Mines; automobile and truck consumption based on registration compiled by National Automobile Chamber of Commerce, and consumption factors worked out by War Industries Board. This chart is not exact in final detail, but is an interpretation of data approximately correct.

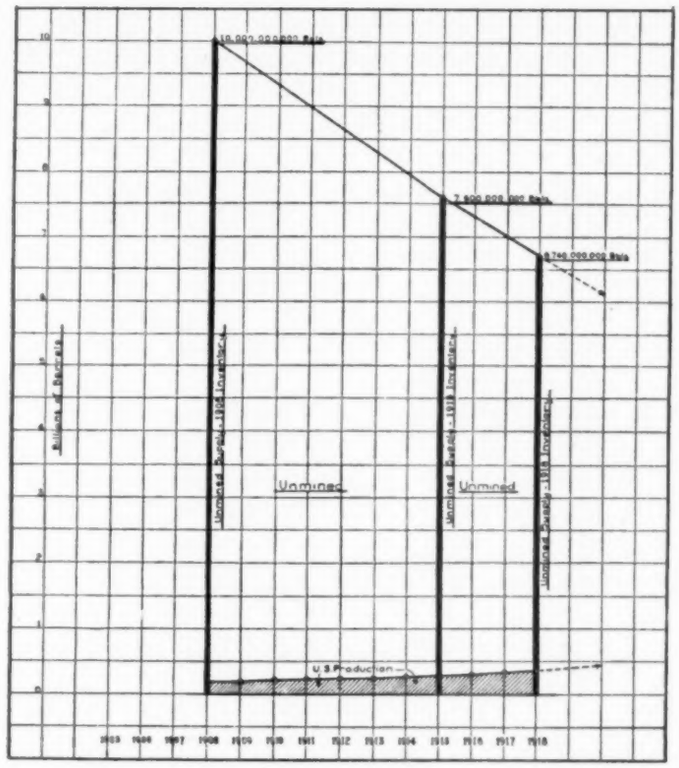
gasoline yield above the natural gasoline content. Obviously, so long as the natural gasoline is not fully extracted from the available crude, there is scant economic room for the development of roundabout (i. e. more intricate, more costly) means for producing gasoline. This was the situation that prevailed in the United States until recently; this is why natural-gas gasoline, cracked gasoline, and low-volatile gasoline are all recent commercial developments.

The proportion of the crude supply subjected to refining in respect to gasoline has been steadily increasing until the quantity so employed now approximates 95 per cent of the total. A much smaller proportion, of course, is subjected to complete refining with the production of the whole range of petroleum products.

Thus practically the whole output has now come to be requisitioned for gasoline production. This is to say that the readiest means for increasing the supply of gasoline (i. e. refining a progressively larger percentage of the crude produced) has been virtually forced to the limit; the "gasoline slack" within the crude production has been taken up. Thus the most potent circumstance that has thus far enabled the demand for gasoline to increase without a concomitant increase in price is no longer in existence. Further expansion in gasoline output will lie thru more difficult avenues than that of merely increasing refinery capacity.

Influenced by Type of Oil

While dependent primarily upon the quantity of crude refined, the output of gasoline is at the same time a function of the average composition of the various crudes that go to make up the total supply. Since crude petroleum varies in its natural-gasoline content from about 2½ per cent in the case of heavy asphaltic oils to 25 per cent or more for light, paraffin oils, it is evident that the gasoline supply will be strongly influenced according to the dominance of the one or other type of oil. As the high-gasoline crudes were the first to be exploited in this country, the unmined supply of petroleum has been selectively reduced in gasoline capacity. The gasoline content of crude oil has been known to decrease even during the life of a given pool, which is a tendency in the same direction as that occasioned by selective extraction in respect to separate pools and fields. So the crude production of the future will show a lower natural-gasoline factor than the crude supply of the past. While this matter cannot be expressed quantitatively, in very rough terms it may be noted that the high-gasoline crudes are about half exhausted, while the low-gasoline crudes, originally of about equal magnitude, are only about a third used up. In other words, the country's gasoline capacity is being drawn upon more rapidly, and hence exhausted more quickly, than is indicated by the condition of the crude supply viewed alone. This tendency was of no immediate consequence so long as it could be compensated by merely refining a greater proportion of the output of crude; but now since practically all of the domestic crude is used for gasoline extraction, a decline in gasoline content can only be offset by shoving crude production to a still higher figure than would otherwise be necessary, or else thru a still greater use of means for wresting an unnatural percentage of gasoline from the crude obtainable.



The domestic crude petroleum situation. Data from the U. S. Geological Survey.

Means of Increasing Output

The means for producing more gasoline than may be obtained by subjecting the total supply of crude to straight refining are: (1) Increasing refinery efficiency; (2) blending high volatile natural-gas gasoline with low-volatile refinery gasoline; (3) Increasing the use of cracking in refinery practice; and (4) Lowering the volatility of gasoline. All four means are in growing use. For the sake of brevity, the first two may be passed over with the comment that, while important, they have quantitative limitations which prevent them from broadly affecting the situation. This is not true of the second two, whose limitations are of a different order.

Cracking is a process attachable to straight refining, by means of which low-priced distillates such as kerosene and fuel oil are re-run more vigorous and partly converted into gasoline. Obviously cracked gasoline costs more to produce than natural gasoline, because of a greater consumption of capital, labor, material, and fuel, and is commercially possible only after gasoline requirements have approached the quantity producable by straight refining, and so long as there is a certain difference in market value between the raw materials used and the product turned out. The first condition has recently been attained, and there is growing economic room for cracking; the second condition, if the prices of kerosene and fuel oil rise, can be maintained only by a proportionate increase in the price of gasoline.

The prospective growth in the use of the Diesel Motor, especially for marine service, with its high fuel economy in the consumption of heavy petroleum distillates, may be expected to lessen the advantage that at the present moment accrues to cracking; altho the price of fuel oil is limited by the price of coal, the advantages of oil over coal for marine service are so marked that fuel oil can probably rise to several times its present price before reaching its limit.

Cost is Factor

Another factor no less potent bearing unfavorably upon the aid that the automotive industry may expect from cracking, is the circumstance that the cost of cracking becomes greater as the percentage of gasoline demanded of a given quantity of raw material increases. This means, so to speak, that a little cracking may spread rather rapidly to all the crude refined, but much cracking will involve a step-up to a higher level of costs. Also the art of cracking is largely undeveloped in respect to asphaltic petroleum, while the retarding influence that private control of patents will exert upon a widespread use of cracking processes should not be left out of account.

Opposed to these unfavorable economic aspects of cracking, which offer relief only upon a basis of higher prices, is the matter of advance in cracking technology toward increased efficiency and lowered costs. Progress of this kind is undoubtedly in store, but advances under this head must work within the broad economic restrictions as laid down above, and can scarcely be counted on to more than temper the price advance competent to maintain the requisite increase in cracking output.

The fourth means for enlarging the output of gasoline independently of the production of crude is thru lower-

ing the volatility of the product. The less specialized the motor-fuel in respect to volatility, the more can be produced from a given quantity of crude by the processes of refining in general use. By a progressive change in character, the supply of "gasoline" can be enlarged, slowly or rapidly at will, without material refinery changes, until it is two or three times the present figure, even with no increase in the output of crude. Since the materials requisitioned in such a change are the basis of kerosene and fuel oil, which can be replaced largely by coal and its products, the transition may be made without a basic disturbance of the country's economic fabric and without setting up counter forces tending to turn back the tide, as would be the case in an over-dependence upon cracking. The practical limit to this enlargement, however, is set by what the standardized automotive engine will accept in the way of fuel; which is to say that this avenue of advance is mainly in the hands of the automotive industry.

Reaching a Limit

The progress of gasoline in this direction has already gone about as far as practicable under existing standards of mechanical equipment; if the fuel current finds an unbreakable dam at this point, the whole pressure of advance will be thrown back into the channels already reviewed. Inasmuch, however, as the past few years have seen the volatility of gasoline steadily decreasing, in spite of laws and the desires of the automotive industry and the public to the contrary, while engine design has already been forced to respond to this circumstance with superficial adaptations, it is apparent that the channels of crude production, cracking, etc., have already demonstrated their incapacity unaided to accumulate the rising flood of gasoline demand. If these main-stays of the automotive industry are failing to meet the issue now, it is hazardous to count upon complete relief in this quarter when the pressure focusing there is rapidly increasing.

We have seen, so far as the petroleum situation in the United States is concerned, that an increasing supply of gasoline of present grade can be maintained into the future only thru a growing use of cracking processes, involving material increases in the cost of production. But there are large oil deposits in Mexico which are believed by many to be capable of sustaining a North American supply of crude sufficient for all demands, even in the face of a slowing domestic output. What bearing does this factor have upon the motor fuel situation?

The oil-producing capacity of Mexico is certainly great, but the size of the underground reserve that will have to sustain production is largely an unknown quantity. The geological occurrence of Mexican petroleum is widely different from that of the oil of the United States, and is of such a nature that the unmined supply cannot be readily inventoried. The output of Mexico to date has come largely from two wells of prodigious capacity, which have been held in check, but one of these wells is recently reported to have gone to salt water. There are, in addition, political difficulties in the way of the exploitation of Mexican petroleum, while the output will have to go in part to Great Britain, whose subjects hold extensive interests in the Mexican fields, and to other foreign countries. Mexican deposits, also, are involved in a large and growing fuel-oil demand in respect to the merchant marines and navies of Great Britain and the United States, which alone will tend to exhaust them rapidly.

Gasoline Content Low

Of even greater significance to the motor-fuel situation, however, than the quantity of crude that Mexico may be expected to contribute to the domestic supply, is the natural gasoline factor of this contribution. Unfortunately the natural gasoline content of Mexican petroleum is low, so that the more the domestic supply of crude is supplemented by imports from Mexico, the more the natural-gasoline factor of the entire crude supply is reduced, the more must cracking methods be called upon to sustain the production of gasoline. Thus, not only is the future of Mexican production a subject upon which adequate information is wanting, but, with the most optimistic assumption in that respect, the character of the supply is such as to be capable of sustaining an output of gasoline only upon a higher level of production costs than now prevails.

This may not be strictly true of gasoline product in Mexico itself as a by-product of fuel oil for a period following the establishment of large "topping plants" and in event of sustained production in that country of crudes containing appreciable quantities of gasoline, but imported gasoline can scarcely be counted on in quantities large enough, or sufficiently soon, to materially affect the situation in the United States.

Thus, Mexico, instead of offering a solution to the motor-fuel problem, promises only to accentuate the issue; especially as the sudden leap in production that is impending from this source will lend a strong color of assurance to the situation.

The statements above in respect to Mexico, without substantial qualification, may be extended to include the oil-fields of Central America as well, which will probably turn out to be heavy producers. As to South America, rather extensive explorations of most of the countries have failed to locate oil deposits of sufficient magnitude to bear materially upon the situation in the United States.

Substitute Motor-Fuels

The petroleum industry is so firmly established and produces such a range of products other than gasoline, that no motor-fuel of non-petroleum origin need be counted on as capable of displacing gasoline. Gasoline can be sold cheaper than any competitor, because of the possibility of shifting part of its cost production onto the shoulders of its joint products. Substitute fuels are to be regarded as supplementary resources, capable of affecting the situation broadly only as petroleum relinquishes the field thru exhaustion.

There are three substitute motor-fuels in sight—benzol, alcohol, and shale-oil distillate. Benzol is now ready to compete with gasoline in a small way; alcohol and shale-oil distillate will be ready to compete only on a higher level of prices. As to resource capacity, benzol is a by-product of coal and the quantity produced is dependent upon the coal subjected to by-product recovery; benzol will be manufactured in constantly increasing quantity, but the total supply can never fill but a small share of the motor-fuel requirement. Alcohol and shale-oil distillate, on the contrary, are main products made from raw materials of almost unlimited availability; they can be produced to fill any need, however great, willing to pay the price. Whether shale-oil distillate or alcohol will eventually become the more important motor-fuel cannot wholly be foreseen, but since shale-oil is similar to crude petroleum and can be made to yield an analogous range of products, a shale-oil industry is certain to supplement and eventually to succeed the petroleum industry, and hence shale-oil distillate is bound to become eventually a prominent motor-fuel. It must be remembered, however, that many years must elapse before a shale-oil industry can become established and grow to significant proportions.

Alcohol, on the other hand, is not so tied up with joint products, and its motor-fuel career will be dictated almost entirely by relative economy and its acceptability to engines evolving on the basis of fuel oil. If motor type broadens so as to fit the petroleum resource, it will at the same time be prepared to receive the aid that benzol, shale-oil, and alcohol may be called upon to render.

On the whole, then, there is nothing in the substitute motor-fuel that would dictate to the automotive industry a policy differing from that determinable upon the basis of the petroleum issue. The substitute fuels remove any physical limit as to the quantity of motor-fuel that may be produced; they offer greater assistance to the situation if automotive apparatus becomes adapted to a less volatile fuel than gasoline, than if present standards are more vigorously adhered to; and they set the bounds to which the price of motor-fuel of petroleum origin can advance—a very rough approximation of this figure being relatively 50 to 60 cents a gallon—suggesting, therefore, to the automotive industry an increase in thermal efficiency competent to offset the advance in price which the substitute fuels will permit and the petroleum situation will ultimately.

Must Co-operate

The foregoing analysis of the resources and technology underlying the prospective supply of motor-fuel indicates that the continued growth of the automotive demand will soon force either an extraordinary dependence upon cracking, with concomitant increase in production costs or else a change in the character of motor-fuel so as to include more and more of the material now going on the market in the form of kerosene and fuel oil. The first adjustment is limited by the physical capacity of cracking, which is largely an unknown quantity, and the extent to which fuel costs can rise without involving curtailment in the growth of the automotive industry.

The second solution is dependent upon the extent to which automotive apparatus may be adopted to consume a fuel less volatile than gasoline. Running thru each solution, and serving to contribute to each, is the extent to which the thermal efficiency, or fuel economy, of the automotive apparatus

may be increased. The more rigorously the present standards of low economy and specialized requirements are adhered to by the automotive industry, the greater the weight that will fall upon cracking, the greater and more sudden the inevitable rise in fuel price, the graver the danger of an industrial reverse.

May Be Precipitate

The fuel resources in sight indicate that a normal balance between supply and demand will eventually be reached, irrespective of the policy of the automotive industry, but the adjustment will result in a different basis of price and character than now prevails. The danger that the situation promises is not that of a permanent break-down in fuel supply thru exhaustion, but of a period of enforced readjustment to new conditions of fuel supply, which may come so suddenly as to catch the automotive industry unprepared and in consequence impose a serious handicap upon its prosperity.

The situation is important not only because the period of readjustment is apparently almost here, but because there are many aspects of the situation that tend to hide the real issues and to lend a false sense of security to those armed with an excess of optimism. American economic experience affords no parallel to the present motor-fuel situation; as demand in the past has almost invariably conditioned supply in American economic practice, it is an easy assumption that this rule will continue to hold in unabated vigor.

New discoveries of oil pools are constantly coming into prominence, while the outlook for oil production never before appeared to be brighter; one easily overlooks that fact that each new pool, in proportion to its magnitude, adds to the unstability of the motor-fuel structure. At this very moment of writing, gasoline is piling up in storage and it is quite possible that before the winter is over the price of gasoline may slightly decline; this may readily be accepted as controverting the whole argument of this paper, if the circumstance is not recognized as an inevitable reaction to a coincidence of season and post-war industrial readjustment. Upon all this come widely heralded announcements of new fuels, with extravagant claims and secret formulas, boldly promising at one stroke an easy solution to one of the most complicated industrial problems that this country faces today. There are indeed spacious arguments for sustaining conclusions quite the reverse of those arrived at here. While one series of circumstances is operating cumulatively to render the motor-fuel situation more and more unstable, another set of circumstances is serving to hide the real issue up to the very brink!

There is scant hope, at this late date, that the automotive demand may be brought into stable adjustment with the motor-fuel supply with results wholly satisfactory to the prosperity of the automotive field, but such difficulties as lie in store may be tempered if the automotive industry as a whole recognizes its responsibility in this matter and acts accordingly. The exigencies of the fuel situation now urge, but shortly will demand, that the automotive industry work toward greater fuel economy and at the same time adapt its mechanical equipment to handle a less specialized fuel than gasoline.

The first can be accomplished in some degree thru car design, but in the main must depend upon engine changes in favor of greater thermal efficiency. The second can be accomplished either thru the development of equipment not dependent upon fuel of high volatility so as to permit the supply of "gasoline" to expand easily, or else by inducing the motor-fuel supply to bifurcate into gasoline of present grade reserved for passenger cars, and heavier distillates to be drawn upon by trucks, tractors, etc., fitted with semi-Diesel or other type of engines suited to such fuel. Apart from the disadvantage of greater costs involved in the production and distribution of two specialized fuels in the place of a single product, and the practical difficulty of unloading the problem onto the heavy-traction portion of the automotive industry, the second expedient would in reality mean merely the turning over of the raw materials of cracking to a counter demand and would leave the gasoline problem still in acute need of attention.

So the economics of the situation—the dictates of resource limitations and human needs—are heard to say that the automotive engine must evolve into a type fitted to gain not only higher efficiency from the fuel consumed, but a greater economy in respect to the activities involved in the production and distribution of the fuel. The answer: greater thermal efficiency in the motor and means for gasifying liquid fuel without requiring it first to be converted by a costly manufacturing process into highly volatile product difficult to store and to transport.

Summary

1. The automotive industry is working without due regard to the motor-fuel situation.

2. The motor-fuel situation is an integral part of the automotive situation and should not be left out of account.

3. Owing to the pressure of automotive demand, the supply of motor-fuel is in course of change, both in respect to character and price, with danger of precipitant alterations; there arises in consequence a motor-fuel problem which cannot be adequately solved without the active participation of the automotive industry.

4. An analysis of this problem is as follows:

(a) The domestic production of crude petroleum is nearing its maximum.

(b) The natural gasoline content of this supply is lessening.

(c) Mexico promises no relief competent to solve the issue.

(d) Substitute fuels introduce no new conditions that need be taken into account.

(e) The supply of motor-fuel can be maintained only thru an extraordinary dependence upon cracking or thru changes in motor type.

(f) Cracking, unaided by adaptations in motor type, can scarcely meet the issue with the maintenance of a favorable price.

(g) The burden therefore falls upon the automotive engine, which must consequently adapt itself to gain higher thermal efficiency and to use less specialized (less volatile) fuel.

Therefore the automotive industry, at once, as an emergency measure, should take steps to shape its development in the direction of increased fuel economy and less specialized requirements as to fuel, establishing for this purpose centralized machinery to study the motor-fuel problem in full detail, to keep the industry informed of every development in the situation, to co-ordinate research and design in the competing units of the industry, and to conduct basic lines of research not now adequately encompassed by the individual agencies.

December Exports Show Falling Off

More than two and a half billion gallons of petroleum in all its grades flowed overseas from the United States in 1918, the exact figure being 2,714,430,452 gallons. This was an increase of 63,312,103 gallons over 1917, the total for which was 2,651,118,349 gallons.

The value of the products exported amounted to $344,290,444, as compared with a value of $252,977,476 in 1917. The figures are truly remarkable and they lend additional weight to the claim that the United States produced 75 per cent of the world's petroleum and products during the war times.

The principal gains in shipments for the year were in crude, gasoline, naphtha, residuum and fuel oils. There was a sharp decline in the overseas exports of the lubricant group, with a total of 257,315,632 gallons, valued at $75,601,939, in 1918, as compared with 280,437,663 gallons, valued at $57,564,864, in 1917.

In the exports for December the report shows a loss both in volume and in value, compared with November. Total exports in December were 186,723,651 gallons, valued at $29,027,415, compared with November exports of 219,172,535 gallons, valued at $30,962,637.

There was an increase in gasoline, naphthas, etc., in December over the preceding month. The total for the former was 54,278,755 gallons, and that for November was 47,693,816. In gas, fuel and residuum there was a marked falling off in exports. The December total was 59,359,017 gallons, while that for November was 86,101,551. In the illuminating group the December total was 40,305,828 as compared with 51,097,986 in November.

The lubricating group showed a falling off of 5,840,432 gallons in December, as compared with the preceding month. The December figure was 18,946,161, and that for November was 24,786,593 gallons.

Crude exports showed a marked increase for the month of December. Its total was 13,833,890, as compared with 9,492,589 gallons for November.

PITTSBURGH, Feb. 9. — Joseph O'Brien, of Washington, Pa., has made preparations to sail for Bucharest to superintend the construction of Standard Oil Company subsidiary plants which were destroyed by the Germans when they invaded Roumania.

The Columbian Steel Tank Company, Kansas City, Mo., announces the opening of a branch office in Dallas, Texas, in charge of J. F. Conrin, 210 Southwestern Life Building, to better accommodate the needs of its customers in the southwest. The company's plant has also been enlarged and a larger welding plant has been built.

Status Of Refinery Practice With Regard To Gasoline Production

An address delivered by Dr. E. W. Dean, of the Bureau of Mines, before the session on motor fuels held by the Society of Automotive Engineers in New York, February 6th, in connection with its annual meeting.

AS ONE of a series of papers discussing future prospects for a supply of internal-combustion engine fuel, the Bureau of Mines has been asked to present information relative to the efficiency of present-day petroleum refinery practice. The Bureau is sufficiently acquainted with this subject to realize the inadequacy of the data upon which discussion must be based. The figures given are actually nothing more pretentious than a series of rough estimates, and any constructive criticism that may be offered regarding them will be welcome.

The several most important ways in which the petroleum refining industry can increase the output of gasoline from a given quantity of crude oil may be listed as follows:

(1) Universal adoption of a high "end-point" or upper volatile limit for gasoline.

(2) General use of more efficient distillation methods and equipment.

(3) Recovery of gasoline now lost in refinery operations.

(4) Wider use of cracking processes.

There are considerable differences in the grades of gasoline marketed thruout the country by different refineries and sometimes at different times by the same refinery. A notable point of variation is the upper volatility limit, or end-point. In the days when gasoline was simply a by-product of the refining industry, the end-point figure was approximately 150 deg. Cent. (302 deg. Fahr.). This type of gasoline is now practically extinct, and the so-called "high-test" engine fuel now marketed in relatively small quantities has an end-point of approximately 175 deg. Cent. (347 deg. Fahr.). The usual grades of gasoline are represented by end-point figures between the limits of 200 deg. Cent. (392 deg. Fahr.) and 230 deg. Cent. (446 deg. Fahr.).

The fact that gasoline of as high end-point as 230 deg. Cent. (446 deg. Fahr.) is being used in tremendous quantity and with satisfactory results renders it desirable to consider the possible increase in engine fuel supply if this upper volatility limit were universally maintained. The Bureau cannot go on record at present as either advocating or opposing such a standard, but is simply discussing what might be accomplished in the way of increased gasoline production if it were adopted. The present estimate, based on miscellaneous data at hand, is that from 15 to 20 per cent more gasoline would be available if a universal end-point equivalent to that of the "heaviest" grade at present marketed in quantity should be maintained.

In this connection it is interesting to note the probable increase that would result if the end-point universally adopted were sufficiently high to include the fractions of petroleum now marketed as kerosene. Bureau of Mines refinery statistics for the calendar year 1917 show that about 20 per cent of the crude petroleum refined was marketed as gasoline, and about 11 per cent as kerosene. If, therefore, the end-point selected were high enough to incdlude both of these fractions, instead of stopping with a figure representative of the "heavy" engine gasoline of today, the resulting increase in supply would be 55 per cent, instead of 15 to 20 per cent. Wherefore, it appears that even the long-sought kerosene consuming engine is not going to keep the automotive industry on "easy street" for many years.

The possibility of such a standard is, incidentally, dependent upon either a considerably increased production of casinghead gasoline or the development of engines that can utilize liquid fuel having smaller properties of volatile constituents than the types now marketed. The high end-point gasoline now marketed is almost invariably of the blended casinghead type.

The distillation methods employed by petroleum refineries do not operate with the same degree of efficiency that is attained in some other industries. Certain percentages of hydrocarbons boiling below the accepted upper temperature limit for gasoline are always present in kerosene or fuel oil. This does not necessarily discredit the technical ability of refiners, many of whom are maintaining as high a degree of distillation efficiency as is profitable under present commercial conditions. There is no doubt, however, as to the possibility of augmenting the gasoline supply thru an increase in the average distillation efficiency of refineries, and it is important to estimate the order of magnitude of the probable gain.

Here again exact data are lacking, and reliance has been placed on miscellaneous indirect evidence. The probability seems to be that efficiency in gasoline recovery varies in different refineries between the limits of 75 and 95 per cent. The latter figure is probably about the maximum that can be economically attained, and the average is undoubtedly not lower than half way between the limits. It is, therefore, improbable that the nation's supply of gasoline will be increased more than about 10 per cent thru advances in the technique of large scale petroleum distillation.

Recovery of Gasoline Lost at Present

Bureau of Mines refinery statistics for 1917 and for the first seven months of 1918 show that an average of about 4 per cent of the crude oil treated was lost in the course of refinery operations. Part of this loss was, of course, inevitable, but part represented gasoline that escaped with refinery gases. Recovery of this gasoline could have been effected by the use of methods and equipment similar to those employed for the production of casinghead gasoline. Such processes are successfully operating, and there is no reason to doubt that the extraction of gasoline from refinery gases will eventually become a general practice.

Assuming that half of refinery losses are preventable in this way, it appears that gasoline amounting to about 2 per cent of the crude oil refined and about 10 per cent of the gasoline produced could be added to the supply of motor fuel.

The wider use of cracking processes is without doubt the most promising means by which refiners can increase their output of gasoline from a given amount of crude petroleum.

In a paper presented before this society about a year ago, the author ventured to state an opinion to the effect that, if cracking processes were employed to the full extent of their applicability, the total production of gasoline from the quantity of crude oil now produced might be doubled.

The future of the cracking processes may be affected by the development of unfavorable conditions of various sorts. Two in particular deserve mention in the present connection.

Up to date, the development of the art of cracking has been far from complete, in spite of the considerable attention that has been given to this line of technical operation. Only one process, that of Burton, is today a real commercial factor in the production of motor fuel, and this is representative of a type that seems to involve certain inherent limitations in applicability. If the cracking reaction is to be applied to the extent necessary for a doubled gasoline production, other types of processes must be put into successful commercial operation, or the present apparent limitations of the class in which the Burton process belongs must be obviated. The Bureau of Mines is optimistic regarding the future commercial success of several other processes, but believes it is only fair to state that such success is not known to have been attained, as yet, in any large measure.

A second development that may restrict cracking operations is the existence of an unfavorable ratio between the market prices of gasoline and fuel oil. The production of cracked gasoline necessitates the consumption of fuel oil, and, if the demand for the latter commodity exceeds the supply, its price is bound to rise and the margin of profit on cracking processes wiped out. It is an open question as to whether or not the consumption of fuel oil can ever be reduced sufficiently to permit doubling the production of gasoline by the use of cracking processes. The Bureau of Mines cannot venture any prediction in this line, except that the price of gasoline is likely to exceed the present level before cracking processes will be employed to the extent indicated.

The estimates included in the present series apparently indicate that the refiner may be able to augment his production of gasoline from a given amount of crude petroleum by from 35 to 40 per cent, exclusive of the gains possible thru wider application of the cracking reaction. Some of the possibilities, however, overlap each other, and a more probable summation estimate is 25 to 30 per cent. The Bureau believes that, if commercial developments are favorable, the wider use of cracking processes may permit of further increases up to a possible additional 100 per cent. No prediction, however, is ventured as to what part of this figure will actually be attained.

Unmined Supply Of Petroleum In U. S.

A paper prepared and read by Dr. David White, chief geologist of the United States Geological Survey, at the motor fuel session of the Society of Automotive Engineers in New York, February 6th.

THE justification of an estimate so highly speculative as must be that of the petroleum resources in the ground in the United States lies in the widening angle between the flattening curve of production and the rising curve of consumption. The standards of living, the industrial power and the prosperity of the country are dependent to so great a degree upon our oil supply, and the question of the adequacy and duration of this supply so directly concerns, at the present moment, the individual citizen as well as the public in general, that an estimate, even if it is but a scientific guess, based, with careful study, experience and judgment on the best information available, is imperatively necessary.

In response to the growing interest of the public, four estimates of the oil resources of the United States have been made. In 1908 Dr. David T. Day, then in charge of petroleum statistics in the U. S. Geological Survey, calculated the total amount of oil originally available in the ground as ranging somewhere between a minimum of 10,000,000,000 and a maximum of 24,500,000,000 barrels. In 1915 Dr. Ralph Arnold placed the original supply of oil at 9,098,557 barrels, of which he believed 5,763,100,000 barrels remained in the ground at the end of 1914. The third estimate was made by the geologists of the oil and gas section of the Geological Survey for the use of the Secretary of the Interior in responding to a Senate resolution of January 5, 1916, and was published in Senate Document 310, Sixty-fourth Congress, first session, February 2, 1916. According to this estimate the reserve of oil available at the end of 1915 was 7,629,000,000 barrels. In the spring of 1917 the production records and the possible oil regions were closely considered with marked conservatism by the same geologists, each studying the regions with which he had field acquaintance, with the result that the total oil available in the ground at that time was estimated at 6,182,000,000 barrels.

In the preparation of estimates by the U. S. Geological Survey consideration has been given to the general character of the geologic formations—stratigraphy, geologic history, structure — the number, thickness, continuity and pore space of sands, the curves of production, the gas pressure, the water relations and the results of drilling in near-by or geologically similar regions. A large part of the producing or possibly productive area in the Western States has been examined and mapped by the oil and gas geologists of the Survey or is now under examination. Typical areas in the Central, Gulf and Eastern States have also been studied. Nevertheless, the criteria upon which estimates can be based vary in every degree of inadequacy in the different regions, and the quality of the results, therefore, varies with the extent and character of the data available and with the personal equation of the estimators. Necessarily the estimates for areas not yet tested, especially those remote from the producing fields, are based upon theoretical conditions, carefully considered. For most of the areas estimates were first formulated by the geologists who had studied the areas. Later, these estimates were discussed in conference.

Recent Geologic Investigations

Further recent geologic investigations in the field and the study of the results of testing and exploration, especially in the Rocky Mountain and Gulf States, have furnished the basis for a more reliable recalculation of the estimates for a number of the regions. The conclusion reached is that the available oil in the ground at the end of 1918 approximates 6,740,000,000 barrels.

The new estimates, combined according to the commercial fields, are given in the accompanying table, in which for comparison and information are shown the marketed production for 1917 and the estimated output for 1918, as compiled by John D. Northrop, of the Geological Survey, in charge of statistics of petroleum and natural gas, and the approximate total production of petroleum in the United States to the end of 1918, also based on Geological Survey records. For the immediate convenience of the reader there is also included the percentage of average gasoline recovery from the oils of the different fields at the present time. For the later data the writer is indebted to Chester A. Naramore of the Bureau of Mines, in which bureau the returns of gasoline recovery from the oil runs are compiled. The general characteristics of the various crude oils in the different fields are too well known to require discussion in this paper, and their especial qualities will be fully considered in those to follow. It will, however, be noted that the reserves of the heavy oils of California and the Gulf Coast are estimated at about 3,000,000,000 barrels. Probably such low gasoline oils comprise more than one-half of the total reserves.

Those who have followed the history of petroleum in America and understand how much of our present-day oil-field development has taken place since Day made his estimates in 1908, and even since Arnold calculated the reserves in 1915, will appreciate the great advantages, mainly in the form of results of exploration and records of production, enjoyed by those who make computations now. However, with these circumstances in mind, we may, nevertheless, for comparison, compensate and bring to date the earlier estimates by deducting subsequent production to the end of 1918. The available oil in the ground at present would be according to these estimates, as follows:

Day (estimate in 1908), 5,402,000,000 to 19,902,000,000 barrels.

Arnold (estimate in 1915), 4,500,000,000 barrels.

Geological Survey (estimate in 1916), 6,647,000,000 barrels.

Geological Survey (estimate in January, 1919), 6,740,000,000 barrels.

The recent estimate by the Geological Survey, as given above, and as differentiated by fields in the accompany-

AVAILABLE OIL REMAINING IN GROUND, AS ESTIMATED BY THE U. S. GEOGRAPHICAL SURVEY

(Bbl. of 42 gal.)

Oil fields	Marketed production in 1917	Marketed production in 1918 (preliminary estimate)	Total marketed production to end of 1918	Available oil left in ground, January, 1919	Present average gasoline extraction, per cent
Appalachian	24,932,205	25,300,000	1,221,737,000	550,000,000	28.0
Lima, Indiana	3,670,293	3,100,000	448,404,000	40,000,000	20.0
Illinois	15,776,860	13,300,000	298,159,000	175,000,000	22.0
Mid-Continent	144,043,596	139,600,000	990,573,000	1,725,000,000	24.0
North Texas	10,900,646	15,600,000	78,971,000	400,000,000	33.0
North Louisiana	8,561,963	13,000,000	90,902,000	100,000,000	28.0
Gulf	24,342,879	21,700,000	303,954,000	750,000,000	1.5
Wyoming	8,978,680	12,370,000	39,793,000	400,000,000	40–50
California	93,877,549	101,300,000	1,114,000,000	2,250,000,000	12.0
Alaska, Colorado, Michigan, Montana, etc.	230,930	230,000	10,651,000	350,000,000	.....
Total	335,315,601	345,500,000	4,598,144,000	6,740,000,000	.....

ing table, differs from that of 1916 mainly in a more conservative view as to prospects in Montana and recoveries along the Gulf coast, and in a more optimistic attitude toward Kansas and the States of little or no present production. As compared with the very conservative estimate formulated in the Geological Survey in 1917 they represent greater confidence in Wyoming, North Texas and Alaska and several of the minor states. In general, they are to be regarded as conservative, and there is little probability that the actual yield will fall short of the calculated amounts. They are, however, likely to be again revised in the near future, as the modes of occurrence of oil and gas in different regions become more fully understood, as exploration proceeds, and as the areas offering possibilities of oil discoveries are examined more in detail.

The reports of production of petroleum in the United States, as compiled by the Division of Mineral Resources of the Geological Survey, show that since 1858 approximately 4,598,000,000 barrels of petroleum has been taken from the ground. This is more than two-thirds as much as the amount which, according to the latest estimate by the Geological Survey, remains available, and exceeds what would now be left according to Arnold. Further, the oil companies are now taking out over one-third of a billion barrels a year.

Relation of Production and Consumption

The situation as to petroleum production and the importance of the remaining oil resources of the United States are both graphically indicated by the curves in the accompanying chart. The most significant features here shown are the steep accent of the consumption curve and the flattening, in 1918, of the curve of actual production in spite of the vigorous efforts of the oil companies to increase their wartime output even at the expense of their proved reserves. To fill the gap between our actual domestic production and the requirements of domestic consumption it has been necessary to reduce the oil in storage to the extent of 27,000,000 barrels and to supplement this with a net importation of 31,000,000 barrels, chiefly from Mexico. The deficiency of our current production during 1918 has, therefore, amounted to 58,000,000 barrels, nearly half of which has been withdrawn from storage. That is to say, this country has to the extent of 27,000,000 barrels of storage oil been "living on its hump," which is now reduced to about 123,000,000 barrels.

According to general expectations, barring disaster or shortage of supply, or much higher prices which might result from such shortage, the consumption is destined during the next year, and probably longer, to continue its present general trend beyond the 400,000,000-barrel mark, which it nearly reached (397,000,000 barrels) in 1918. On the other hand, whether the domestic production can be increased in volume to correspond to the consumption remains to be seen. Glenn pools and Cushings may await discovery, but the strike of a Glenn pool such as produced the bulge in the storage curve for 1907 and 1908, or of the new Healdtons and Cushings, such as were largely responsible for the production swell of 1914-15, will make a less conspicuous wave in the greatly expanded and diffused production of today. Texas, the Osage country and Wyoming will furnish notable contributions, but so many fields are now running down that it will require numerous successive strikes of large magnitude to send the production curve so high that oil will go into storage without considerably increased importations. On the whole, even with prices stimulating the driller to greater efforts, it seems unlikely that the domestic production of petroleum can at best gain appreciably on the reasonably expected increase in consumption. It seems more probable that, unless consumption is restrained by high costs, the gap between consumption and production will continue to widen. In any event, this gap must be filled with oil from other sources. Further exhaustion of stocks in 1919 is a certainty that can be successfully minimized only by still larger importations.

The situation demands not only the prevention of waste, but the most economical and efficient use of our oil. Also it warns operators to consider more thoughtfully and promptly the acquisition of foreign oil reserves. Mexico, to which the American public looks with optimistically hopeful eyes, probably contains less oil—perhaps very much less—than remains in the ground in the United States.

How long the commercial production of natural petroleum will continue in this country is a question whose answer is no less speculative than the quantitative estimates. After the production peak is passed, be it one year or seven, the annual output of natural oil will decline gradually for a long time. Oil wells will be producing at least 75 years hence. The pools cannot all be so soon discovered; the oil cannot immediately be got out of the ground. The discovery of deep sands is likely to give new life to many old or even abandoned fields. Pools will be found after prolonged search and repeated wildcatting in old as well as new regions, and this is probably especially true of the Gulf coast, where, unless geologic discovery and consequent new methods of search, come to the aid of the driller, it may be 75 years before some of the productive salt domes are revealed.

The most significant feature of the prospect, however, is the probability that, altho an estimated two-thirds of our reserve is still in the ground, with an annual drain of one-third of a billion barrels, the peak of production will soon be passed—possibly within three years. The date when the peak will be reached is a matter of individual opinion, in which predictions have wide range. There are many well-informed geologists and engineers who believe the peak in the production of natural petroleum in this country will be reached by 1921 and who present impressive evidence that it may come even before 1920.

Development of Oil Shale

In her deposits of oil shale the United States has an anchor to windward. Oil shale is a richly bituminous shale, some of it approaching cannel in character, interbedded, like a coal, in series of shales, sandstones and limestones. The most extensive and valuable deposits known in America if not in the whole world are in northeastern Colorado, northeastern Utah, and southwestern Wyoming, mainly in what is known as the Uinta Basin. Rich beds of oil shale also occur in very limited areas in northeastern Nevada. Minor deposits, more conveniently located but for the most part leaner and less promising, are found in the Mississippi Valley and the Appalachian states. D. E. Winchester and A. R. Schultz, of the Geological Survey, have estimated that there are in Colorado, Utah, Wyoming and Nevada deposits of oil shale in thicknesses of 3 feet or more, and capable of yielding 25 gallons or more of oil per ton, sufficient to produce at least 75,000,000,000 barrels of oil.

The oil is generated thru the destructive distillation of the shale, and its character and composition depend largely on the processes employed. Rough dry or steam distillation tests produce distillates—essentially heavy petroleums—carrying both paraffin and asphalt with considerable nitrogen and yielding gasoline in an average of about 12 per cent. These rough tests indicate that the gasoline obtainable by distillation of these shales, even by simple methods, far exceeds in amount all the petroleum yet produced in the United States and may equal the remaining natural oil.

The production of oil from these shales is still in the experimental stage, in which various methods are being tested. Much doubtless depends on the processes devised and adopted. It is possible that initial commercial success may be determined as much by a study of methods and of the possible by-products and their values as by a further advance in oil prices. The technologic problems connected with the utilization of the oil shales are worthy of research by the best hydrocarbon engineers and chemists.

Shale oil is the most natural, satisfactory and ample substitute for petroleum, and it is likely to come into the market as the production curve of the natural oil glides downward beyond the peak, if not sooner. It must be borne in mind, however, that in spite of the probable very rapid growth of the shale-oil industry beginning with the day that shale oil is produced profitably on a commercial scale, it will require several years to construct and put into operation the enormous plants necessary to treat the millions of tons of shale which must be distilled in order to offset the waning production of natural oil, or fill a part of the gap between the production and consumption of petroleum in the United States.

Preparing History

WASHINGTON, Feb. 11.—The Fuel Administration, in co-operation with the War Trade Board, is preparing a history of petroleum and petroleum products during the war. The War Trade Board is compiling similar figures for all commodities.

Unofficial estimates show that finished petroleum products advanced proportionately less than most other commodities, and less than crude prices.

The purpose of the undertaking by the joint government bodies is to make a scientific study of price fluctuations, explain their causes and show the effects of war demands and war restrictions upon prices in general.

Mexico A Source Of Petroleum Products

An address prepared by R. De Golyer, consulting geologist of New York, delivered before the motor fuel session of the Society of Automotive Engineers in New York, February 6th. Read in the absence of Mr. De Golyer by Dr. Pogue.

MEXICO, with its production of approximately 67,000,000 barrels in 1918, apparently achieved second place among the petroleum-producing nations of the world. The United States, with a marked production of some 345,000,000 barrels, was secure in first place, but it is certain that revolution-ridden Russia could not have produced enough of its normal 60,000,000 to 70,000,000 barrels to enable it to retain second place.

This position, now gained by Mexico, will soon be relinquished. The potential production since 1911, the year in which Mexico became an exporter of petroleum, has been far in excess of the actual production, which in the past few years has been limited by the serious tank steamer shortage resulting from the great war. With the ending of the war, the tankers are being rapidly released and many of them are going into the Mexican trade. Petroleum for the present year is likely to be greatly in excess of that of 1918.

There are two general regions in Mexico from which petroleum has been produced—the highly important Tampico-Tuxpam region and the less explored Tehuantepec-Tabasco region. The Tampico-Tuxpam region, which includes the section of the Gulf Coastal plain adjoining the ports of Tampico and Tuxpam, is the region from which practically the entire commercial production of Mexico comes at the present time.

The fields of the Tampico-Tuxpam region are divided generally into two groups—those of the Panuco River valley region and those of the southern or Tuxpam region. The fields of the Panuco River valley region, including the Panuco, Ebano-Chijol, and Topila pools, produce heavy viscous petroluem of 10 to 13 deg. Baume gravity which are used principally in their crude state as fuel oils. The fields of the Tuxpam zone, including Potrero del Llano, Casiano-Tepetate, Cerro Azul, Los Naranjos, Alamo, and Furbero pools, produce lighter petroleums of 19 to 22 deg. Baume gravity which are the Mexican petroleums used generally for refining purposes.

Approximately 69 per cent of the petroleum produced in Mexico in 1917, the last year for which detailed statistics are as yet available, was of this grade, and 31 per cent was of the heavier Panuco grade. The proportion of the lighter crude was probably even greater in the production of the past year. Of the 1917 Mexican petroleum production, some 77.6 per cent was exported. Exports for the past year show an even greater percentage and will increase as the Mexican production increases. Of the petroleum remaining in the country during 1917, the equivalent of 5.2 per cent of the total production represents fuel consumed by the Mexican railways and 1.5 per cent represents petroleum consumed principally as fuel in the industry itself. The remaining 15.5 per cent of the total production includes petroleum and products consumed in Mexico, refining losses, increase in storage, if any, etc.

Export Trade With U. S.

The United States is the greatest single market for Mexican petroleum. In spite of limited transportation facilities during 1917 because of tanker shortage, the United States took petroleum and products from Mexico equal to 65.9 per cent of its entire production. Other nations took 11.7 per cent. The imports of crude petroleum distillates, and various refined products from Mexico to the United States during that year were equal to more than 10 per cent of the entire production of the United States in its banner year, the one just past.

The benefits resulting from this condition are reciprocal. The United States profits by getting the petroleum, and Mexico, by the nearness of a great market where, as a result of experience acquired from the utilization of its own immense petroleum supplies, American industries are accustomed to the use of petroleum and its products to an extent not equalled in any other country of the world.

It has been noted that the potential production of Mexico is far in excess of its actual production. It is estimated that the total capacity of wells already completed in Mexico is more than 1,000,000 barrels per day. In other words, if the petroleum could be taken care of, so that the wells could be opened at once, the rate of production would be some eight to ten times the actual present rate. This potential production is slightly greater than the present actual production of the United States. The comparison is likely to mislead, however, unless it is remembered that the production of the United States is an actual proved production and can be maintained for some time by drilling up proved areas, whereas, to maintain the actual production of Mexico for a year at its potential capacity would undoubtedly require the discovery of new fields.

Rock Caverns

We have been so impressed by the unprecedented size of some of the Mexican gushers and by their continued production of large quantities of petroluem over long periods of time without any appreciable decline in amount of petroleum produced daily or in field pressures that we have perhaps overestimated the total amount of petroleum to be secured from any single pool. The explanation of the great gushers seems to lie in the very great porosity of the rock in which the petroleum occurs. It collects in a network of caves and channels previously dissolved out of a bed of very thick limestone by the action of water. This condition allows the petroleum to move about very freely while still underground. Furthermore, the petroleum generally lies over water under an artesian head and as a consequence the field pressure is largely hydrostatic rather than gas pressure, which in most oil fields is the expulsive force causing the oil to flow. Effectively, the result of these conditions seems to be that in Mexico there are deposits of petroleum which can be exhausted with a single well, whereas a deposit of the same size under different conditions of occurrence would require hundreds if not thousands of wells to exhaust it. For comparative purposes it might be noted that there are two wells in Mexico, Potrero del Llano No. 4 and Juan Casiano No. 7, either of which has produced more petroleum than any single field along the Gulf Coast of the United States, while the production of the biggest fields of the Gulf Coast has come from hundreds, if not thousands, of wells, in each instance. The gusher condition in Mexico seems to indicate ease in exploiting rather than such abnormally large pools as have been inferred from the great size of the gushers encountered.

Development Since 1910

Until 1910, both the actual and potential production of Mexico were almost insignificant, in fact, not great enough to supply the domestic trade of Mexico itself. Petroleum was imported from the United States and refined at the Minatitlan plant of the Mexican Eagle Oil Company and the Tampico plant of the Waters-Pierce Oil Company. Small amounts of petroleum were produced at Furbero and in the Isthmus of Tehuantepec and refined by the Mexican Eagle Oil Company at Minatitlan. A small amount of very heavy petroleum produced at Ebano by the Mexican Petroluem Company was being topped in a small field plant. The distillate was sent to the Tampico refinery for further treatment and the residue made into asphalt or used as fuel on the Mexican railways. The highly important Dos Bocas had been lost by fire and the discovery wells in the Casiano field had fallen off in production until there was some doubt whether they would be able to supply enough petroleum to run the pipe line then under construction to Tampico.

During 1910, however, the Potrero and Tanhuijo fields were discovered and Potrero No. 4, which has since produced more than 100,000,000 barrels of petroleum, was brought in. Juan Casiano No. 1, with a record second only ot that of Potrero No. 4, was completed and the discovery well in the Panuco field was brought in.

The potential production of Mexico thus became so great that she had petroleum far in excess of her own requirements—far in excess of the capacity of transportation systems reaching tidewater and thus making the petroluem available for export. This condition has been permanent since that time, so that today the developed production of Mexico is greater than can be carried to tidewater by her rapidly developing pipe-line systems or river-barging equipment. Even if the entire present production could be got to tidewater, it is doubtful whether there are enough ships available to distribute it to the world markets or whether the markets could immediately absorb it. Great fleets of tank steamers to carry Mexican petroleum have been built by the Eagle Transport Company., Ltd (British), and the Petroleum Transport Company (American), controlled by the Pearson and Doheny interests respectively, the foremost producers of Mexican petroleum.

The members of this Society are doubtless particularly interested in estimates

of the future petroleum supply which can be expected to come from Mexico. The future of supply rather than the past is of greater interest to prospective consumers.

Estimating petroleum reserves is under the best of conditions a somewhat uncertain business. There was the old method of calculating the oil content of a field or property from the thickness and porosity of the oil-bearing rock. The estimate so secured was modified by a safety factor of 20 to 50 per cent to cover petroleum which could not be mined, and on the resultant guess was based the best estimate as to petroleum reserves. The correctness of such a form of estimate depends largely upon a felicitous selection of the safety factor.

We do a little better now perhaps by estimating the probable production of wells to be drilled or the reserve remaining in wells already producing by comparison with the production of average wells in the same or in similar fields. Such a study involves the construction of production curves, the various points on a curve being determined by plotting the amounts produced from a single well or an average well as the ordinates, with the fixed units of time in which produced, arranged consecutively, as the abscissas. Data for the construction of such a graph, to be of any value, must show the changes in the amount of unrestricted production of a given well or average well during various units of time.

We can make estimates of reserves in the Mexican fields by neither method. We have no data as to thickness or porosity of the petroleum-producing formations and consequently cannot use the volumetric method. The bulk of petroleum from Mexico has come from wells of such size that only the production from a restricted flow could be utilized. Production curves constructed on such artificially restricted data as are available under these conditions would be almost valueless. Nevertheless, we can make a rough guess as to the fields already producing in Mexico. It seems fair to assume, on the basis of past performances, that the fields already producing in Mexico indicate what one might call a blocked-out reserve of from a half billion to a billion barrels of crude petroleum.

Will Locate New Fields

Geologic conditions indicate that other petroleum fields of greater importance than those now known will yet be discovered in Mexico. So far as exploratory drilling is concerned, the petroleum regions have been but scratched. Not more than 1,000 wells have been drilled in all of Mexico since the earliest attempt to discover petroleum. Included in this are a great number of wells drilled for exploitation purposes in fields already discovered, and a number of wells drilled in Tabasco, the Isthmus of Tehuantepec region and various outlying regions.

Remarkably few wells are being drilled in Mexico when one considers the amount of petroleum produced. According to official statistics, seventy-nine wells were dried in 1917, and of them forty-three were productive, with an estimated initial output of 235,027 barrels, and thirty-six were dry holes and abandoned. For comparative purposes, it might be noted that 1,117 wells were completed in Kansas and Oklahoma in the single month of July, 1918. These successful wells have been in proved pools with the single exception of Molina No. 2, which was drilled during the latter part of 1917 and which was the discovery well of a new field.

The greatest needs of the Mexican petroleum industry at the present time are some relief from the continually increasing taxes, which are apparently designed to be confiscatory, and some degree of safety in the petroleum-producing regions in order that much needed drilling of an exploratory nature may be carried out.

The use of crude Mexican petroleum in internal-combustion engines has not yet passed beyond the experimental stage, but more and more crude petroleum is being refined for its light oil products and this forms an increasingly important addition to the world's supply of engine fuel. The Mexican Eagle Oil Company, Ltd., has refineries at Minatitlan and Tampico and a topping plant at Tuxpam. The Waters-Pierce Oil Company has refineries at Vera Cruz and Tampico. The Standard Oil Company of New Jersey has a refinery at Tampico. The Texas Oil Company has topping plants at Port Lobos and Tampico. The Doheny interests have a topping plant at Tampico and an asphalt plant at Ebano. The Atlantic Refining Company has a topping plant at Port Lobos.

Only the 19 to 20 deg. Baume petroleums of the Tuxpam region are refined in quantity in Mexico. All of the refineries and topping plants run it except the Tampico plant of the Texas Company, which tops some Panuco crude, the Ebano asphalt plant, which runs Ebano crude, and the Tampico refinery of the Waters-Pierce Oil Company, which runs a very small amount of Topila crude besides much greater amounts of Tepetate-Casiano, Naranjos and Potrero crudes.

Panuco crude is used mostly for fuel purpose. It is so viscous that after the very small light oil fraction has been removed, the residue can be handled only with the greatest difficulty and by specially designed equipment. Panuco crude is imported to the United States and, after being mixed with Gulf Coast crudes, is successfully refined. One American refinery is reported to crack Panuco crude, thus securing 12 to 16 per cent of gasoline or engine fuel.

Has Limitations

The greatest possibilities for future extended uses of Mexican petroleum seem to lie either in the future perfection and more widespread development of internal-combustion engines using very heavy oils as fuel, or in an improvement of refining methods by which heavy oils can be more easily converted into lighter oil. It is likely that both methods will be utilized. In the past several years the continued development and widespread use of internal-combustion engines has created such a demand for fuel that it has been supplied only by great efforts on the part of the producer and refiner of petroleum. Fortunately for the petroleum industry, this demand has set the mark and the internal-combustion engine has not waited to be assured of a source of supply for a fixed number of years in advance.

As to the great advantage of the use of Mexican petroleum in internal-combustion engines over its use as fuel for boiler installations there can be no doubt. In this connection, one can hardly do better than quote from a recent paper by Lord Cowdray, head of the Mexican Eagle Oil Company, Ltd., and affiliated organizations:

It should be stated that Mexican oil, especially refined for use in Diesel engines, is now available for motor-ships. It is possible that the subject of internal-combustion engines for ships has been discussed with an excess of optimism and led to expectations that have not yet been fully realized, but the most conservative observer cannot fail to be impressed by the solid progress already made in this direction, and the utility of the oil engine for moderate-sized vessels seems to be soundly established. The primary advantage is disclosed in the following figures, given approximately the comparative consumption by main and auxiliary machinery for various types of marine propulsion.

It will be seen that the oil engine can claim the lowest consumption; the vessel's radius is considerably increased. These are factors which will inevitably insure a great future for motorships, and the provision of fuel supplies on an ample scale will accelerate their progress.

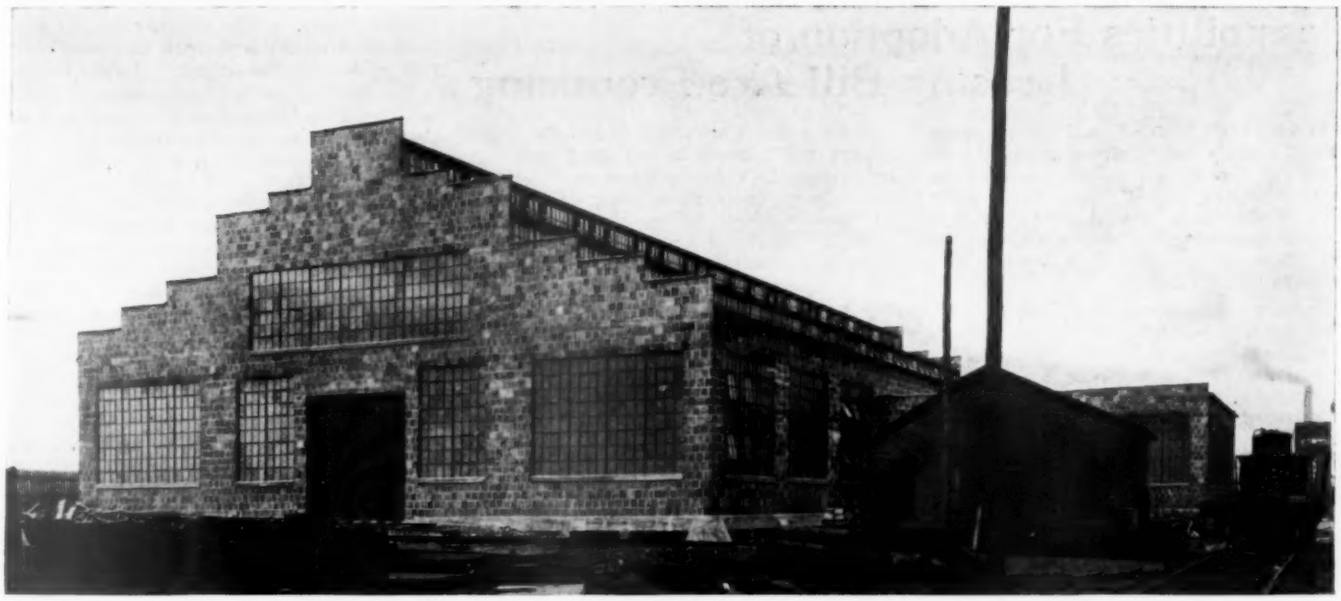
	Lb. of fuel per hp.-hr.
Steam engine, coal-fired	1.60
Steam turbine, coal-fired	1.30
Steam engine, oil-fired	1.00
Steam turbine, oil-fired	0.82
Oil engines	0.50

Statistics covering the production of petroleum by years since the beginning of the industry have recently been made public by the Petroleum Commission of the Mexican Government. They show the past history of Mexican petroleum and indicate prospects for future increases in production better than can be done in any other manner.

Year	Bbl.	Metric tons.
1901	10,345	1,544
1902	40,200	6,000
1903	75,375	11,250
1904	125,625	18,750
1905	251,250	37,500
1906	502,500	75,000
1907	1,005,000	150,000
1908	3,932,900	587,000
1909	2,713,500	405,000
1910	3,634,080	542,400
1911	12,552,798	1,873,552
1912	16,558,215	2,471,375
1913	25,696,291	3,835,267
1914	26,235,403	3,915,732
1915	32,910,508	4,912,016
1916	40,545,712	6,059,589
1917	55,292,770	8,264,266
1918 (estimated)	57,000,000	10,000,000
Total	289,082,472	43,166,241

It is confidently hoped that the future production of the Mexican fields will bear out fully the continued increase in amount indicated by the foregoing figures and that it will stop the constantly increasing and extremely critical gap between production and consumption in the United States.

FORT WORTH, Feb. 9.—The American Association of Oil Geologists will meet in Dallas, March 13th to 15th, inclusive, the date having been changed from March 6-8, so as not to conflict with the sale of Osage restricted lands at Pawhuska, Okla., March 5th. Secretary W. E. Wrather makes the announcement that headquarters will be at the Adolphus Hotel, but that meetings probably will be held in the Dallas City Hall auditorium. At least two night meetings will be held.



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Possibilities For Adoption of Leasing Bill Are Promising

WASHINGTON, Feb. 11.—It is possible Congress will enact a general leasing bill at this session. That has been the word near the end of every session for the last six years. But this time there is a better prospect than heretofore because the conferees of the two houses have come to an agreement.

Senator Smoot, of Utah, one of the men most interested in the matter, at the time this was written had not attached his signature to the report. The other conferees declined to give out the details of their agreement lest such breach of official routine offend him and he refuse to attach his name and thus make it impossible for the agreement to be approved by the two houses. Senator Pittman, of Nevada, one of the conferees, made this statement as to what has been done:

"The conferees have patiently tried to reach an agreement that will tend to a greater reduction of the mineral reserves of the country and at the same time completely protect the interests of the government.

"The President and the various departments of the government have for six years been urging upon Congress the necessity for providing a law for the development of the millions of acres of oil land now withdrawn from use. It is apparent that unless new oil fields are discovered and developed in the near future there will not be sufficient oil for domestic use and for the operation of the navy and our proposed merchant fleet.

"The conferees finally accepted the provisions of the house bill with regard to the naval reserves, which provisions met with the approval of the secretary of the navy, the secretary of the interior and the attorney general. In substance it prevents all development in the naval reserves except thru the existing flowing wells. These wells may be leased to the parties who sunk them, where no fraud exists, upon a royalty to be fixed by the department at no less than one-eighth of the oil produced.

"While in the opinion of some of the conferees on the part of the Senate, this is not doing full justice to the individual who discovered this oil and did the development, it is the best that can be obtained and at least saves the parties from bankruptcy.

"As to lands outside the naval reserves, the acreage provided in the Senate bill was adopted, while the terms of the lease and the royalty to be paid thereon were taken from the House bill. In other words, a bona-fide claimant, who is not guilty of fraud, may surrender all claim and title and receive a lease upon his claim upon such royalty as the government may fix. The present agreement is the only possible one that could be reached, and in my opinion is a better compromise than can ever be reached if it is not ratified by the House and the Senate. Every item of disagreement was contested to a finish. Each side surrendered all that in conscience it could surrender. Nothing more can or will be conceded by either side. If this legislation now fails, further efforts at oil legislation, in my opinion, will be useless and the fight will go on for many years more. Anyone who sincerely seeks legislation on this subject must support the report."

Saving the California claimants from bankruptcy is about all of good that can be said of the compromise by those who have been advocating the cause of the claimants. They think Congress has put up the price of barrels so that the California men are about as much to be pitied as the victim of the money shark. The section on which the Californians are to be permitted to settle is as follows:

Provided, that any claimant who, either in person or through his predecessor in interest, entered upon any of the lands embraced within the Executive order of withdrawal dated September 27, 1909, prior to July 3, 1910, for the purpose of prospecting for oil or gas, and thereupon commenced development work thereon, and thereafter prosecuted such work to a discovery of oil or gas, shall be entitled to lease from the United States the producing oil or gas well or wells resulting from such work at a royalty of not less than one-eighth of all the oil or gas produced and saved therefrom, together with an area of land sufficient for operation thereof, but without the right to drill any other or additional wells thereon, except as may be authorized by the president, and no wells shall be drilled on lands subject to the terms of this act within six hundred and sixty feet of any such leased well, without the consent of the lessee thereof:

Provided further, that where the president shall determine that it is to the public interest, he may lease the remainder of any such claim to the claimant, upon such terms and conditions as he may prescribe:

And provided further, that all such claimants shall pay, in such manner as the president may determine, to the United States an amount equal to not less than the value when produced of one-eighth of all the oil and gas already produced and saved from such well or wells:

And provided further, that no claimant whose well or wells may be involved in any suit brought by the United States or in any application for patent shall be entitled to a lease under this proviso unless within six months after approval of this act he shall relinquish to the United States all rights claimed by him in such suit or application, unless the president shall further extend such time. No person who has been guilty of any fraud, or who had knowledge or reasonable grounds to know of fraud, or who has not acted honestly and in good faith, shall be entitled to a lease under the provisions of this act.

The provisions relating to the oil shale lands is as follows:

Sec. 14. That the secretary of the interior is hereby authorized to lease to any person or corporation qualified under this act any deposits of oil shale belonging to the United States and the surface of so much of the public lands containing such deposits, or land adjacent thereto, as may be required for the extraction and reduction of the leased minerals, under such rules and regulations, not inconsistent with this act, as he may prescribe; that no lease hereunder shall exceed five thousand one hundred and twenty acres of land, to be described by the legal subdivisions of the public-land surveys, or if unsurveyed, to be surveyed by the United States, at the expense of the applicant, in accordance with the laws and regulations for the survey of public lands.

Leases may be for indeterminate periods, upon such conditions as may be imposed by the secretary of the interior, including covenants relative to methods of mining, prevention of waste, and productive development. For the privilege of mining, extracting, and disposing of the oil or other minerals covered by a lease under this section the lessee shall pay to the United States such royalties as shall be specified in the lease and an annual rental, payable at the beginning of each year, at the rate of 50 cents per acre per annum, for the lands included in the lease, the rental paid for any one year to be credited against the royalties accruing for that year; such royalties to be subject to readjustment at the end of each twenty-year period by the secretary of the Interior:

Provided, that for the purpose of encouraging the production of petroleum products from shale the secretary may, in his discretion, waive the payment of any royalty and rental during the first five years of any lease:

Provided, that any person having a valid location to such minerals under existing laws on January 1, 1918, shall, upon the relinquishment of such location, be entitled to a lease under the provisions of this section, for such area of the land relinquished as shall not exceed the maximum area authorized by this section to be leased to an individual or corporation:

Provided, however, that no claimant who has been guilty of fraud in the location of any oil-shale bearing lands shall be entitled to any of the benefits of this section:

Provided further, that not more than one lease shall be granted under this section to any one person, association, or corporation.

Ranger Incorporates As Sure Enough City

Staff Special.
FORT WORTH, Feb. 7.

The town of Ranger, Eastland county, in the heart of the development of the oil field of the same name, and which previously had been an unincorporated village, took on its city dress this week, when it voted to incorporate, nearly 50 to 1. An election will be held at a later date for the choice of municipal officials, after which an improvement campaign is contemplated.

Until now, the town has been policed by Texas rangers, and the civic affairs of the town have been largely in the hands of the secretary of the Chamber of Commerce, who has been in effect a city manager. The paving of streets, the construction of concrete walks and the general upbuilding of the town along structural lines is to be taken up, the vote to incorporate making possible steps toward the elimination of almost impassable conditions in the streets that have deterred progress over a period of months.

J. P. Graver, president of the Wm. Graver Tank Works, and president of the Petroleum Club, has been making an extensive western tour for several weeks in the interests of the concern, while his brother, Phillip, has been in eastern territory.

MID-CONTINENT FIELD

405½ MAIN STREET
FORT WORTH, TEXAS

402 COSDEN BUILDING
TULSA, OKLAHOMA

Mid-Continent Yield Now At Highest Point Since Last July

Staff Special,
TULSA, Feb. 10.

MID-CONTINENT production, including that from the Oklahoma, Kansas, north Texas and north Louisiana fields, during the week reached the highest point it has attained since last July, totalling 450,000 barrels a day. Ever since last July production from these fields had showed a steady decline until three weeks ago, since when it has been slowly but steadily climbing.

This is due mostly to the new production being brought in in north Texas, where the daily production at the end of last week was 115,000 barrels, an increase of about 3,300 barrels over the preceding week. The Kansas production was 80,000 barrels a day, a slight increase over a week ago.

Cushing has regained the lead over the Healdton field by a small margin after Healdton, some weeks ago, took the lead by something in the neighborhood of 2,500 barrels. Cushing daily production at the end of the week was 39,000 barrels, a slight decrease from that of the preceding week, and the Healdton production was 38,300 barrels, also a slight decrease.

Interesting Test Near Fisher.

One of the most interesting wells in Oklahoma during the week was near Fisher, a few miles southwest of Tulsa. Here Minshall and others have a well reported as producing at the rate of 60 barrels an hour in a sand found at 2,200 feet in Sect. 21-19-11. In northern Oklahoma two of the Marland Oil Company's wells are attracting attention, their No. 1½ Murdock, in Sect. 2-27-3E, which is reported producing 50 barrels a day from a sand found at 1,775 to 1,790 feet. Their No. 9 Mollie Miller, in the northwest corner of Sect. 9-25-2E, which came in a week ago producing 2,000 barrels, is now reported as doing 800 barrels.

In the Osage, Graham & Bird have a 200-barrel well after a shot in their No. 5 in the center of the south line of the northeast quarter of Sect. 6-24-10E in the Bartlesville sand found at 2,120 feet. A wildcat test of Landon and others found the sand at 1,500 feet in the southeast corner of Sect. 16-28-9E.

Kansas Has Promising Well.

An interesting well in Kansas is that of the Ellenhurst Development Company, in Sect. 10-22-4, Marion county, north of Eldorado, on the Gillette farm. At two feet into the sand found at 2,515 feet oil filled up the hole and slopped over the top of the casing. The well is estimated good for 300 to 400 barrels.

In Stephens county, Texas, where thirty new locations have been made, most of them by the Texas Company, the Texas Company has had several flows of oil from its well on the Graham farm. This well, if it turns out a producer, extends production northward nearly sixty miles, being the farthest northwest well in the deep sand territory, between fifty-five and sixty miles northwest of the most northerly of the Comanche county wells.

FORT WORTH, Feb. 11.—The Magnolia Petroleum Company's Woodward tests, offsetting the Leon Valley Oil Company's Haynes, southwest of the Duke Knowles production in Comanche county, is showing for 150 barrels at 2,818 feet.

FORT WORTH, Feb. 11.—The Texas Company's No. 1 Black Brothers, 15 miles north of other Stephens county production, and nine miles east of the Graham well, in Young county, now is flowing 60 barrels daily after making less than 200 barrels originally two months ago.

Late Field News

FORT WORTH, Feb. 11.—Cosden & Company's Holcomb test, two miles east of the town of Eastland, in Eastland county, had failed to develop production at 3,860 feet, and probably will be abandoned. The Arkansas Natural Gas Company's C. U. Connellee, four miles south and a little east of Eastland, which showed up around 3,200 feet, was drilling at 3,586 feet, or 17 feet into black lime.

FORT WORTH, Feb. 11.—The Texas Company's Stoker well, due south of Breckenridge, Stephens county, which made 250 barrels at 3,182 feet, was drilled one and one-half feet deeper and now is flowing 1,800 barrels daily.

Oklahoma Report

Aside from the Minshall 60-barrel an hour well in the 2,200-foot sand near Fisher, in Tulsa county, the Yale pool was the center of interest in Oklahoma development during the week.

In the Yale district, the Gypsy Oil Company's test on the Running Fox allotment, Sec. 5-19-5, was drilled sixty-six feet into the pay sand found at 3,167 feet and made 30 barrels natural. The total depth of the well is now 3,233 feet. The well will be given a shot.

In Carter county, the Empire Gas & Fuel Company has a well in the center of the southeast quarter of the northeast quarter of Sec. 34-2S-3W that is reported making from 200 to 250 barrels from the sand found at 2,327 to 2,345 feet.

There is considerable activity in Cotton county, Oklahoma, across the river from Burkburnett. The Burk Queen Oil Company has a rig up for its No. 1 test on the northeast quarter of the southeast quarter of Sec. 23-5-13W and location has been made for Burke No. 1 in the southeast quarter of the northeast quarter of Sec. 14-5-13W.

Two abandonments marked the week in the Duncan district, the Magnolia Petroleum Company, getting a dry hole and abandoning its No. 1 Russell, Sec. 26-1S-9W at 2,050 feet and Parkers's No. 1 Bronson in the southeast quarter of the northeast quarter of Sec. 30-1S-10 being abandoned at 2,390 feet.

Keys and others have a rig up for a test at their No. 1 Roberts in the southwest corner of Sec. 22-1S-10W. The Texas Company has an 8,000,000-foot gas well at 675 feet in its No. 1 Shirley test, Sec. 36-1S-5W.

The Big Ben Oil Company's No. 2 E. Lewis in Sec. 2-13-11E is reported good for 300 barrels in the sand 2,415 to 2,425 feet.

Late Test May Extend Production Northward Into Young County

Staff Special.
FORT WORTH, Feb. 7.

Extension of the central west Texas productive area nine miles north into Young county would result from the satisfactory completion of the Texas Company's test on the Graham ranch, 14 miles west of the town of Graham in the bend of the river. This well was reported in reliable quarters at the end of the week to be good for 175 barrels of oil daily from a depth of 3,972 feet. It is a question, operators point out, whether this quantity of oil at such a depth will pay, so that pending such time as greater production may be found, the excitement to be registered by the Graham test was limited by this condition.

Nearest production to the Graham test ranges southward into Stephens county, which adjoins Young on the south, the Texas Company some time ago getting a 150-barrel well on the Black Brothers tract. In Stephens county, the Sinclair Gulf Oil Company's Ledbetter No. 1, five miles south of the town of Caddo, is shut down at 3,433 feet with 1,000 feet of fluid in the hole. The test will be shot with 440 quarts of nitro-glycerin at 3,280 feet, where a showing was encountered, and if the result is similar to other shot wells in this section the Ledbetter test may be expected to prove a 500 or 600-barrel producer.

Carey Well Makes Roily Oil

The Mid-Kansas Oil Company's No 1 Carey, two miles southwest of the town of Caddo, is making roily oil, which because of its cut condition has to be treated before running into the pipe line, and is showing eight per cent of water from a daily production, initial, of 4,000 barrels. This well was first completed three months ago and considered practically dry. It produced 300 to 400 barrels daily after a shot, but when it was gone into to take out the squib wire with which the shot was placed, it began making 4,000 barrels, the hole evidently having been bridged over in the shooting operation. It is said positively that the water coming out with the oil is not from the producing sand and that it is either the result of a leaky collar or the casing having been burst by the shot.

Six miles north of the town of Eastland, and northwest of the Ranger district proper, the Parrack test of the States Oil Corporation, which started flowing 500 barrels daily after deepening from 3,665 feet, is now showing water from a total depth of 3,697 feet. The drill went thru the sand and now is in white lime. An actual gauge of the well is said to show it making 146 barrels with some water, which the management argues is coming from above, but which other operators contend is in the producing sand.

Markham Producer Brought Bac

The No. 2 Copeland of John H. Markham, Jr., drilled in conjunction with the Tidal Oil Company, and which offsets the Prairie Oil & Gas Company's Emma Terrell, stopped flowing early in the week and was shot with 400 quarts of nitroglycerin. It is again flowing 150 barrels. The Terrell well, which it offsets, set a record as the largest producer in the Ranger district.

A late report on the Magnolia Petroleum Company's T. W. Connellee well, which had been variously reported good for 5,000 to 8,000 barrels initial, and which actually gauged 4,920 barrels the first 24 hours, shows it producing 3,300 barrels at this time. The Hivick and others test on the Johnson strip, near Olden's Switch, is drilling at 3,510 feet and does not look good for the big pay in the deep sand, but is reported showing for a light well at 3,450 feet.

The Humble Oil & Refining Company's No. 1 Patton, offsetting the Gulf Production Company's No. 1 State-Collett, in a southwesterly direction from the Ranger field proper, is making 30 barrels daily from 3,490 feet. The Gulf's Collett will be shot, as it so far has not proved satisfactory as a natural producer. The Gulf's No. 2 Collett, at the other end of the tract, is making about 1,300 barrels daily.

Mud Cuts Down Operations

At least a third of the tests drilling in Eastland county, in which the Ranger district is situated, are shut down because of the condition of the roads, which has prevented transportation to and from the field in many instances. This condition also is true of Comanche county, where the Duke-Knowles development, northeast of Ranger, is situated.

A broadening of the Comanche county producing area three miles northward into Eastland county is indicated by the picking up of a showing by the Magnolia Petroleum Company in its test on the Davis tract at 2,945 feet, after it had been practically given up as a failure. The test will make a 20-barrel well, it is now said, but is at a depth 200 feet deeper than where the other wells in the pool were productive.

The Leon Valley Oil Company test on the Haynes tract, a mile and three-quarters south and a little west of the Duke and Knowles wells, is standing with 1,500 feet of fluid in the hole with very little gas at 2,730 feet, according to one report. It had seven feet of pay and then went into the white lime formation. Another report is to the effect it is spraying oil and is estimated good for 125 to 175 barrels daily.

Six miles south of the Duke wells, Connelly and Aquarre were reported to have had a small showing at 2,687 feet, and are now moving out tankage with the hole drilled to a total depth of 2,725 feet. This test is on the Epler tract. Twenty miles southwest of the Duke, the Humble Oil & Refining Company had a showing for 2,000,000 cubic feet of gas at 2,680 feet, but now is drilling below 3,000 feet without any further evidence of either oil or gas production. The Tex-Penn Oil Company's Payne test, half a mile due south of its original Duke, is a dry gasser, making 25,000,000 cubic feet. It has so far failed to show oil.

In Erath county, east of Comanche, and one and a half miles northeast of the town of Duffau, the Fouts test of Burk and Griffiths had a rainbow showing at 2,579 feet, but is now drilling at 2,890 feet in white water sand. This test is in the southern part of the county.

The B. R. Bailey test on the Gilliam tract, Brown county, which it was believed for a time would open up a deeper pool adjacent to the shallow Brownwood development, is variously estimated good for 10 to 25 barrels daily at 2,460 feet after having been cleaned out. It has been flowing by heads out of a hard sand, but arrangements are being made to pump it.

What Districts Are Producing

Brownwood production totals 660 barrels out of the 1,185 barrels daily produced in central west Texas and outside of Eastland, Stephens and Comanche counties. Coleman county has 70 barrels daily production, the Moran pool 110 barrels and the Strawn district 345 barrels. Eastland county (Ranger) is producing 45,525 barrels daily, Stephens county is making a daily average of 6,240 barrels and Comanche 4,825 barrels.

South of the Oklahoma line, on the Texas side of the river, the Burkburnett pool added roughly 6,000 barrels to its daily average production over the week, making at this time 51,325 barrels. The Electra pool is good for 12,450 barrels daily, Iowa Park 60 barrels, Holliday 185 barrels and Petrolia 590 barrels.

New Wells In Kansas Make Fair Showings

Staff Special

TULSA, Feb. 10.—Interest in Kansas development during the past week centered upon the new stuff in Marion county, north of the Butler county pool where the Ellenhurst Development Company has a well estimated to be good for 300 or 400 barrels.

Oil filled the casing and ran over the top when the bit had reached two feet into the sand. The National Oil Company's No. 1, Eyestone Sect. 8-23-4, which last week looked good for a 25-barrel well or better, is reported to have a fishing job at around 2,240 feet. This test tapped the sand at 2,010 feet with a showing for about 10 barrels.

At 2,030 feet a second pay was struck which gave a showing of from 25 to 30 barrels. The first pay sand struck is at a depth more than 425 feet above that from which No. 2 Leydig well, a mile to the south, is producing. The test was considered as of great importance, as it not only extends the field a mile but shows the trend of the pay sand to the northeastward.

The Sinclair-Markham test on the Ferrell tract, Sect. 28-28-8, which had a showing of oil last week, has a hole full of water. The well was drilled to a depth of 2,746 feet and is now reported to be plugging back to the top of the sand at 2,690. The present plan is reported to be to plug and then cement back to the sand. It is expected that the well will eventually be completed as about a 10-barrel producer.

About a 35-barrel well is reported for the Falkenberg No. 4 of the same interests, and the well seems to be drilling itself in and getting better. A week ago Saturday it gauged 17½ barrels, Sunday 22 barrels and Monday 35 barrels. It looks very encouraging to oil men who are watching the test with considerable interest.

The Empire Gas & Fuel Company has about a 10-barrel well in its No. 2 Lowe, Sect. 3-32-5E, after a shot. The well is producing from the sand at 2,375 feet. The well was drilled to 2,400 feet and plugged back. The Carter Oil Company's No. 1 Craig, Sect. 3-32-5E, is a dry hole and abandoned at 2,750 feet.

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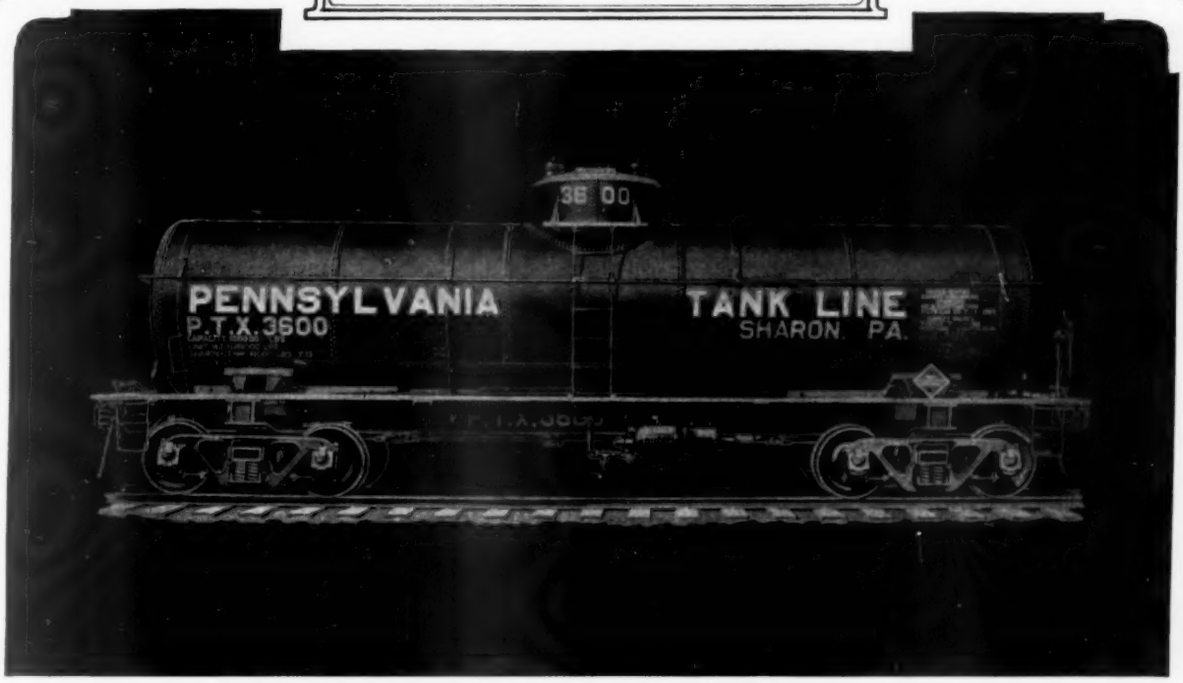

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Texas Oil Men Take Up With Assembly Matter Of Sane Taxes

BULLETIN.

FORT WORTH, Feb. 10.—Texas oil operators will be satisfied with the House committee's recommendations for a one and one-quarter per cent production tax, it is generally believed, provided it is in lieu of all other taxes. It may be accepted as satisfactory if it is in addition to existing ad valorem taxes, according to C. C. Gumm, of the Fort Worth Chamber of Commerce, speaking for the North Texas delegation of oil men.

Bills providing taxes on leases and refinery output have been adversely reported.

Staff Special.

FORT WORTH, Feb. 7.

Representatives of various branches of the oil industry who composed a delegation before the Texas legislature at Austin early in the week, made it clear that they did not appear before the assembly as a protest squad, but, instead, for the purpose of co-operating to the end that the legislators might understand the industry's position toward clean, dependable development and how it may be carried thru without the possibility of hampering influences.

Taxation measures before the legislature constitute the bills regarding which the oil industry is most concerned, three of which now are before a House committee. These include a bill levying an occupation tax of two per cent on the gross production of oil, the present tax being one-half of one per cent; a bill providing that an oil lease shall vest in the lessee an interest in the land and that such interest shall be rendered and assessed for taxation; and a bill levying against refineries an occupation tax of two per cent on all refined petroleum products.

Gill Appears as Spokesman

In appearing before the House committee, Judge W. H. Gill, of Houston, spokesman for the Independent refiners, argued that a tax of one per cent on gross production would be fair to the oil interests,but he pleaded against refinery taxation on the ground that this branch of the industry would be thereby destroyed, adding that plants would be driven out of the state. He argued that one refinery management with a plant in the Wichita Falls district under project was waiting until the position of the legislature became known before going further with its plans, for the reason that adverse action would be followed by the locating of the refinery across the Red River in Oklahoma, to be connected with the Burkburnett oil field by a short pipe line. Figures were offered to show that the proposed two per cent gross sales tax would really amount to three per cent on the revolving fund of the refinery, as the tax is not on the investment, but upon the finished product. The present tax of two per cent, on some refineries, reaches the wholesaler who buys and sells again, but does not reach a refiner who refines his own crude oil. The present bill was enacted, according to R. A. Johns, of the Texas Company, to reach refineries outside the state of Texas marketing their products manufactured outside the state and to encourage development of the industry within the state. It was pointed out by Mr. Johns that passage of the newly proposed bill affecting refineries would reverse the situation.

"If you will let the refineries alone," said Judge Gill, "they will spread all over the state; if you make it so that Texas refineries cannot sell gasoline at as low a price as the Standard Oil can sell it, the Texas refineries will have to quit."

Amount Is Question At Issue

It was developed at the hearing that counsel for producing interests are of the opinion the Texas constitution contains an inhibition against the levy of a gross production tax in lieu of all other taxes, such as prevails in Oklahoma. In view of the fact that the excise is a tax on business and not on property, and is to be cumulative of the ad valorem tax on property, the question revolves around a pivot as to what shall be the figure.

The legislature's action toward the production tax is considered problematical at this stage, but the outlook is that the refinery excise will not be adopted. As regards the taxing of leases, it was pointed out to the House committee that there are more than 500,000 acres under lease in the state of Texas, and, according to Judge Gill, not more than 50,000 acres have a drop of oil under them. It was pointed out that taxation of this character would tend to discourage leasing and consequently discourage later development of acreage except by the largest interests, and even then the tendency would be to curb "wildcatting."

Conference at Fort Worth

A delegation present from Fort Worth consisted of W. B. Byron, vice president of the Gulf Production Company, in charge of the North Texas district; A. G. Reed, of the Cosden Oil & Gas Company; C. C. Crum, of the Fort Worth Chamber of Commerce, and J. D. Collett, Independent operator.

A meeting was held in Fort Worth prior to the visit to Austin, which was widely attended by representatives of the industry. Mr. Byron advocated at this meeting the abolition of the present law prohibiting the changing of river courses. He took the position that ample water supply for development could be reached in many instances merely by the cutting of ditches. The damming of streams for commercial purposes is prohibited, and the abolition of this act also was urged. It was pointed out by one speaker at the conference that operations in Stephens county are being retarded because water cannot be piped from the Clear Fork of the Brazos river for development purposes.

Would Open Up School Lands

The legislature has before it two bills of interest to the oil and gas industry of a different character than revenue taxation. One of these, by Senator Buchanan, of Scurry county, provides for the sale of the oil, gas, coal and lignite on all the unsurveyed lands of the state belonging to the free schools. This bill is designed to encourage development of industry.

Workers Will Make Room For Soldiers

Staff Special

FORT WORTH, Feb. 6.

Almost coincident with a statement by President R. E. Evans, international president of the Oil Field, Gas Well and Refinery Workers of America in Fort Worth that an organizer had been assigned to the South Texas and North Louisiana districts, it was announced from Shreveport that the Oil City, La., local No. 25, had issued an open letter declaring that its members are ready to aid returning soldiers to find employment.

They agree "that if any member of this local is at present holding any position that rightly belongs to an ex-soldier or sailor, and the company so desires, will gladly see that said member shall give up the position to the soldier or sailor, as we believe this to be only right."

A week ago, the Texas, Gulf Coast and Louisiana Oil and Gas Association had issued a statement pointing to its action in Houston, January 13th, insisting that no discrimination should be shown either for or against oil field workers who were either members or non-members of a union, this in effect declaring for the "open shop," which resolution at the same time urged the employment of soldiers as a type fitted by military discipline and training to become efficient and loyal workers.

Organizers attempting to unionize the southwestern oil fields were accused in the association statement with spreading propaganda that the operating companies were making ready to reduce wages, which charge the oil producers denied, pointing out that the managements of the Gulf Production Company, the Texas Company, the Sinclair Gulf Oil Company, the Humble Oil & Refining Company, the Magnolia Petroleum Company, the Republic Production Company, the Sun Company and the Standard Oil Company of Louisiana declared this to be without foundation.

Announcement to the effect that new locals had been established at Caspar, Wyo., New Orleans, Salt Lake City, two in North Louisiana and two in Oklahoma, was made by President Evans of the oil workers. He had just returned from South Texas, where he said three new locals had been established. Information from other than union circles is to the effect that little headway has been made by the organization movement in the Ranger district. An organizer, it is said, will be sent into the Wichita Falls district, which embraces Burkburnett development, at once. There has been some activity on the part of organizers in Oklahoma and Kansas, and an organization meeting was held both at Drumright and Shamrock, Okla., late in January.

FORT WORTH, Feb. 9.—The Plains Oil & Gas Company, which has extensive holdings in the Ranger field, re-elected its existing officers at the annual meeting held in Ardmore, Okla., as follows: President, Wirt Franklin; vice president, L. H. Love; secretary and treasurer, Edward Galt; W. B. Johnson and Roy Johnson, directors, other than the officials previously named. Other principal stockholders include P. C. Dings, D. C. Fitzgerald, T. A. Thurmond, B. A. Simpson and C. L. Anderson.

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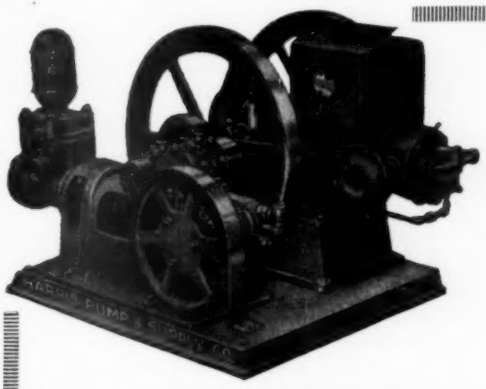

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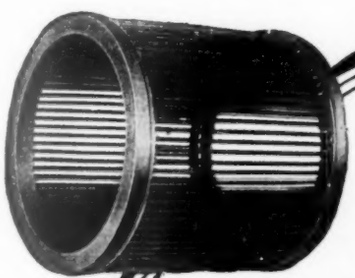

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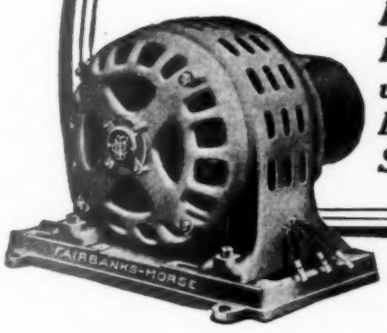

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Operators Join In New Welfare Plan

Staff Special
FORT WORTH, Feb. 8

Action taken by the Texas Gulf Coast and Louisiana Oil and Gas Producers' Association at Houston, February 3rd, toward the improvement of working and living conditions in the oil fields, was but a concerted step toward putting into general application a policy inaugurated in the North Louisiana districts by some of the larger operators more than a year ago.

While the steps previously taken by individual companies, both in North Louisiana and the Gulf Coast section, had been largely confined to the construction of company houses where necessary to provide proper living quarters, another step at that time was the establishing by the Gulf Refining Company of Louisiana of a commissary department, which maintained boarding houses in the fields, where for a nominal sum palatable meals were to be obtained by the workers.

Improvements contemplated under the concerted action set on foot by the association consider sewerage facilities, an improved water supply, more comfortable living quarters, recreational centers, better schools and libraries. Cost of such improvements would be borne by the operators represented in the association, prorated according to the extent of the holdings of each in the districts affected.

The employment of someone qualified to study the needs of the workers and suggest remedial measures was considered necessary, according to a report of a subcommittee that had conducted an investigation, and the retaining of such a welfare worker was discussed at length. He would work with the executive committeemen from the four districts established, in which meetings of operators are to be called for the appointment of two representatives to serve on district committees, a third representative in each case to be selected by employes.

The success of such measures as those taken by the Gulf Refining Company in establishing its commissary department and by the other companies, particularly in the coastal section thru the construction of housing facilities, had played its part in the realization of the operators that the improvements contemplated would make for more contented and more efficient employes.

An investigation of the workings of a commissary department, such as that maintained in North Louisiana by the Gulf, recently showed that the operating company carried a debit of from $200 to $400 a month, in some instances, when the profit and loss sheets were examined over a period of months.

Work of the association in its improvements campaign will be carried on in District No. 1 (North Louisiana) from Shreveport headquarters, in which territory Cal K. Clarke, of the Standard Oil Company of Louisiana, is the member of the executive committee; District No. 2 (South Louisiana), C. O. Noble, individual operator, executive committeeman; District No. 3, comprising the Spindletop, Saratoga, Sour Lake and Batson districts of Gulf Coastal Texas, J. C. Wilson, independent operator, executive committeeman; District No. 4, consisting of the Humble, Goose Creek, Hull, West Columbia, Damon Mound and Markham fields, Judge R. E. Brooks, of the Texas Company, executive committeeman.

Forms Partnership In Oil Business

Staff Special.
TULSA, Feb. 10.

L. O. Carter, who for the past ten months has been connected with the W. R. Bruce Company, and recently with Bruce & Bryan, has severed his connec-

L. O. Carter

tion with that company to form a partnership with W. A. Steele, under the firm name of Steele & Carter.

The new firm, which will have offices at 404 World building, pending the completion of the First National Bank building, in which they have taken quarters, will conduct a general marketing business. Mr. Steele, who is well known in Mid-Continent oil circles, was formerly connected with a large oil company here, and for some time has been in the marketing business on his own account.

Mr. Carter was at one time traffic manager and later sales manager of the same company, leaving late last spring to accept employment with Mr. Bruce.

Humble Well In The Burkburnett Doing 1,300

Staff Special.
FORT WORTH, TEX., Feb. 10.

The Humble Oil & Refining Company's No. 1, which extends from the Burkburnett townsite field, approximately a mile northwest, coming in ten days ago for an estimated initial production of 4,000 barrels, is making 1,300 barrels daily. Two abandonments by the Humble Company are reported over the week, one on the W. C. Myers farm at 2,300 feet, and the other on the Maxwell tract below 2,000.

More than two dozen completions, ranging in initial production from 300 to 1,500 barrels, but were within defined territory. There are roughly 300 tests drilling at Burkburnett, 175 new rigs and locations, and casing has been set in 14 tests. Producing wells in the district number approximately 180.

In the southern part of Archer county to the south of the shallow Holliday pool, the Northwest Holding Company's Andrews test is pumping 30 barrels from 900 feet, opening up a new area.

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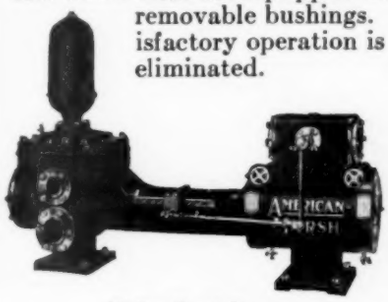

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Extensive Operations Prophesied In The North Louisiana Field

By Special Correspondent.

SHREVEPORT, LA., Feb. 10.—Deeper drilling in the Bull Bayou district, south of the old Crichton development of North Louisiana, has resulted in the production of two grades of oil in an area where extensive operations are forecast. Wells drilled to the 2,650 foot sand have been producing a grade of light oil equivalent to Red River (Crichton) crude, which is selling to the pipe lines at $1.75 a barrel, and the comparatively few holes put down to the 2,725 foot pay are giving up oil of higher quality that is equivalent to that produced in the old De Soto field, which bears a market of $2.15, or only ten cents a barrel less than Caddo 38 gravity and above.

Operators in the North Louisiana fields who also have interests in the west Texas development area are authority for the statement that a campaign of deeper drilling along the Red River-DeSoto parish line already has gained considerable proportions and that a wide area previously tested out will have to be re-drilled. Already, there are a number of good producers in the deeper pay that followed the completion of the Texas Company's B-8 Wemple at 2,725 feet, making 800 barrels initial and calling attention to its possibilities. This well had not been satisfactory in the 2,650 foot stratum, where other wells were producing on the Wemple "B" tract, so that it was deepened, and the higher grade production developed at a depth of only 75 feet further.

The completion by the Bull Bayou Oil Company of a 300-barrel well that after three months is holding up to a daily production of 100 barrels also was responsible for more attention being paid to the district, altho this production comes from the so-called 2,650 foot pay at 2,670 feet. It is on the Armistead tract, in Sect. 19-12-10, and when it declines still has to be drilled to the deeper stratum, as doubtless other wells in the surrounding territory will be put down.

Jenkins tract wells of the Gulf Refining Company of Louisiana, E-6 and E-7, were put down to the deeper stratum, as were B-9 and B-10 Wemple of the Texas Company, after B-8 had developed the possibilities. These all were all good producers, each making several hundred barrels initial production.

In Bull Bayou

New locations have been made or tests are drilling in the immediate vicinity (this development taking the name of the Bull Bayou pool) by the Fortuna Oil Company, which will drill its Polly, Chaffraix and Pugh tracts; the Arkansas Natural Gas Company on the Hollingsworth; Keen and Woolf on the King and the Mangum; J. M. Eastham on the Chaffraix; Henley and others on the Chaffraix; and the Bull Bayou Oil Company on the Armistead, where Nos. 2 and 3 are under way.

The original, or "discovery" well in the De Soto field was drilled some five or six years ago to a somewhat greater depth than those now producing from the deep pay in the Bull Bayou district, but it was a mile or more distant, to the west and southwest. The original well was on the Giauque tract, and while it had its effect upon the drilling of the Jenkins and Wemple leases to the 2,650 foot stratum, earlier tests than the present in the Bull Bayou area either were productive in this stratum or were abandoned before the 2,700 foot level was reached.

In the excitement attending the Pine Island development in the heavy oil district of Caddo, some of the possibilities of the southern fields were overlooked, as a result of which the larger operators have not taken on any considerable new acreage in the Bull Bayou district, leasers and smaller companies obtaining the best of the acreage not previously taken up. Now that the district's possibilities are realized, it is getting added attention.

The discovery of oil in Claiborne Parish, has been taken more seriously by representative oil men than any previous wildcat development in the history of the North Louisiana field, coming as it did, just following a period of depression caused by the action of the pipeline companies in refusing to take the production from the famous Pine Island district, it has proved the immediate salvation of the oil industry in this territory. The Pine Island operations are practically paralyzed and much of the capital just ripe for investment in that district has been diverted to the new field.

Unfortunately, the company which pioneered the development in Claiborne Parish, has fallen on dark days and is having a hard time to insure to themselves the fruits of their enterprise. After a long series of mishaps and the usual vicissitudes attending the drilling of a well in wildcat territory, their funds ran low just at a critical period, when the rentals had fallen due on the 17,000 acres of leases surrounding the well, and fifteen days later the well came in with an initial production estimated at 2,500 barrels.

The money was immediately forthcoming, but too late to prevent a universal blanketing of leases, with the result that innumerable lawsuits have been started and the company placed in a most unenviable position. Expert legal advice has been obtained and a notice issued that all claims to the land originally leased by the Consolidated-Progressive Oil Company will be contested in the courts, but the topping goes merrily on and some interesting complications are bound to ensue.

Under Litigation

Most of the land in the immediate vicinity of the new well is either under litigation or in the hands of the Atlas Oil Company and the Consolidated, but thousands of acres have been leased from three to fifteen miles distant and a number of interesting locations made for immediate drilling. Baird & Flynn have made a location for No. 1 Robinson in Section 28-22-8, five miles northwest of the Homer well; J. M. Parker, of Kansas City, is arranging to drill on the Harmon lease in Section 9-21-7, three miles northeast, and several locations are being made in from four to seven miles southwest of the well. A wildcat test in Webster Parish, fifteen miles northwest of the Homer development is attracting considerable interest.

Caddo heavy dropped another twenty five cents during the week, making the present market price one dollar and adding greatly to the depression of oil operators in this district. The few completions that are being made are being closed in as none of the new oil is being taken and thousands of barrels of production from old wells is going to waste on account of the pipeline situation.

The Standard Oil Company completed a 3,500-barrel well on the Keoun lease, in Sect. 19-21-14, in the east end of the field, showing that the district is still in its prime and that great things can be expected of it by those who are in a position to carry their holdings over the present critical situation. The Sun Company's No. 115 Bradford, in Section 24-21-15, came in flowing and pumping at the rate of 300 barrels a day, and the Dixie Oil Company's No. 2 Christian in Section 27-21-15, made a 100-barrel pumper.

In the Elm Grove district, Bossier Parish, the Arkansas Natural Gas Company abandoned its No. 75 Palmer in Sect. 10-16-11, at 2,600 feet.

In Quachita Parish, the Southern Carbon Company completed a 35,000,000-ft. gas well in No. 1 Fairbanks, Sect. 15-19-4, at 2,250 feet.

Drilling Operations

The completion of the big well on the Keoun lease by the Standard Oil Company has started considerable activity in this immediate vicinity, despite the fact that there is at present no way of disposing of the oil produced in this district. J. L. Bullock, trustee, has started drilling No. 2 Noel in Sect. 19-21-14; the Humble Oil Company is building derrick for No. 5 Noel in Sect. 19-21-14, and in the same section, Palmer Trustee is building derrick for No. 1 Noel. The Laska Oil Company is rigging up to drill No. 1 State in Section 26-21-15; the Little Oil Company has derrick up for No. 1 North in Sect. 34-21-15, and the Caddo Oil & Refining Company is rigging up to drill No. 1 Cummings in Sect. 20-21-14.

The Atlas Oil Company has set liner and is testing at 2,475 feet in No. 2 Logan, Sect. 26-21-15; Dickinson et al have made a location for No. 1 Player in Sect. 26-21-15; the Houston Ice & Brewing Company is drilling at 2,125 feet in No. 4 Huckaby, Sect. 14-21-15; Laskey et al are drilling at 150 feet in No. 1 Player, Sect. 26-21-15, and the Manilla Oil Company at 2,475 feet in No. 1 Sibley, Sect. 29-21-15.

Jones et al are drilling at 1,175 feet in No. 1 Campbell, Sect. 2-20-15 and in the same section W. G. Souders is down 150 feet in No. 1 Hicks and the Over the Top Oil Company is drilling at 800 feet in No. 1 Hicks. The Romax Oil Company is drilling at 1,775 feet in No. 2 Noel, Sect. 25-21-15; the Sammies Oil Corporation is drilling at 2,150 feet in No. 2 Weiss, Sect. 15-21-15, and has set liner at 2,400 feet in No. 2 Charbonnett in the same section; the Western Oil Fields Corporation is drilling at 2,250 feet in No. 1 Head, Sect. 26-21-15, and in the same section No. 2 is rigging up to drill and location has been made for No. 3.

The Solano Oil & Gas Company is drilling at 1,000 feet in No. 1 Roland, Sect. 4-21-15; the Rae-Woods Oil & Gas Company is drilling at 1,575 feet in No. 1 Huckaby, Sect. 9-21-15; the North Star Oil Company has set 6-inch casing and

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will test in the shallow sand in No. 1 I. Blanchard, Sect. 8-21-15, and the Mississippi Oil & Gas Company is drilling below the 6-inch casing in No. 3 Olds, Sect. 9-21-15.

The Gulf Refining Company has made an interesting location in the Bethany district, adjoining the recent development in Panola county, Texas. The test is on the W. C. Agurs land in Section 1-16-16, two miles north of Bethany, and is down about 100 feet.

Birdsong et al are rigging up to drill on the Frost Johnson Lumber Company lease in Sect. 1-11-16, two miles east of Logansport in De Soto Parish.

On the east side of the Bayou in Red River Parish, Eastham & Kendall have derrick up for No. 1 State in Sect. 23-12-11, having acquired a valuable lease of river bed lands from the state in this territory. Hickman & Kyle are drilling at 850 feet in No. 1 Hollingsworth, Sect. 24-12-11. The Bull Bayou Oil Company is drilling at 1,000 feet in No. 2 Armistead in Section 23-12-11, and have derrick up for No. 3. Freedman-Rowe et al are rigring up to drill No. 1 Carter in Sect. 13-12-11. The Arkansas Natural Gas Company is rigging up to drill No. 82 Hollingsworth in Sect. 19-12-10. The Depositors Oil & Gas Company has made a location for No. 1 Polley in Sect. 7-12-10, and the Fortuna Oil Company has derricks up for No. 1 Chaffraix in Sect. 26-12-11 and for No. 1 Pugh in Sect. 13-12-11.

Operations in this district are vieing in importance with those of the Homer field, the only drawback being the extreme depth at which the pay is found in the Bull Bayou district. Both are light oil districts but the oil in Clairborne Parish was found at a depth of 1,400 feet, while that in the southern district is down 2,700 feet. The shallow wells can be drilled for from six to eight thousand dollars and are consequently attractive to small operators, while those in the Bull Bayou district would require three or four times as much capital and their results are no more certain.

Fuel Oil From New Egyptian Field Reported

Reporting on oil fields in Egypt, the Commerce Reports for February 3rd, as issued by the U. S. Bureau of Foreign and Domestic Commerce, says:

The prospect of a good supply of oil fuel from Egypt are very promising. At the beginning of the war the Anglo-Egyptian Oilfields was the only one of the various companies formed to search for oil in Egypt that remained in operation, and down to 1914 the only finds of importance had been at Gemsah, where none of the gushers that had been struck had given anything like a permanent yield. But the new field discovered in 1914 at Hurgada has been proved to be of singularly regular formation, and its yield has steadily increased, until according to recent reports, it now stands at over 15,000 tons of crude oil a month.

Meanwhile the Suez refinery has been enlarged, and there is every reason to hope that as much oil will shortly be available for internal consumption as can be dealt with by the company's existing facilities.

Crude Production For Dec. Off 380,416 Bbls.

WASHINGTON, Feb. 10.—Production of crude during December, 1918, showed an increase of 182,804 barrels over the corresponding month of 1917, according to the figures compiled by the United States Geological Survey. The summary represents the December operations of 190 companies handling or receiving crude directly from the wells in the fields east of the Rocky Mountains.

The crude produced in December, 1918, the report shows, amounted to 19,637,286 barrels. This is a falling off of 380,416 barrels, as compared with the output for November of the same year. The daily average increase in December, compared with the same month of the preceding year, was 5,736 barrels.

There was a falling off in deliveries of crude in December, as compared with the same month in 1917 of 991,192 barrels, and of 46,939 barrels as compared with November, 1918.

Crude stocks at the end of December showed a depletion of 22,876,259 barrels from the total at the end of December, 1917, the stocks at the end of the former month being 96,268,452 barrels, as against 119,144,713 at the end of December, 1917. Storage was reduced 2,760,940 barrels from the total at the end of November, 1918.

The following table shows comparative figures of crude produced, delivered to refineries, and stocks in storage for December, 1918, and December, 1917:

Crude Petroleum Moved From Field Sources—(Barrels of 42 gallons Each.)

Field	December, 1918	December, 1917
Appalachian	2,408,327	1,934,367
Lima-Indiana	246,213	223,753
Illinois	1,059,309	1,433,528
Okla.-Kans.	9,609,795	11,753,935
Cent. & N. Texas	2,116,789	963,333
North Louisiana	1,388,139	490,510
Gulf Coast	1,695,036	1,800,917
Rocky Mountain	1,113,678	854,139
Total	19,637,286	19,454,482

Apparent Deliveries of Crude Petroleum to Refiners or Other Consumers

Class of Oil	December, 1918	December, 1917
Appalachian	2,204,498	2,122,637
Lima-Indiana	298,255	277,702
Illinois	1,035,921	2,020,868
Okla.-Kans.	13,154,781	14,063,307
Cent. & N. Texas	1,970,669	785,202
North Louisiana	1,217,321	793,249
Gulf Coast	1,364,468	2,499,332
Rocky Mountain	1,152,313	827,113
Total	22,398,218	23,389,410

Stocks of Crude Petroleum at End of Month

Class of Oil	December, 1918	December, 1917
Appalachian	3,704,248	3,858,646
Lima-Indiana	1,155,527	1,953,712
Illinois	2,200,478	3,583,471
Okla.-Kans.	69,832,286	95,447,119
Cent. & N. Texas	5,281,504	2,510,809
North Louisiana	4,933,537	2,623,445
Gulf Coast	8,237,877	8,651,917
Rocky Mountain	922,995	515,593
Total	96,268,452	119,144,713

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Plan To Increase Operations In Mexico

Oil Companies There, Despite Attitude Of Carranza Government, Enlarge Handling Facilities

By Special Correspondent
TAMPICO, MEXICO, Feb. 1

THE only distinguishing feature in the Mexican oil situation at present is the increased number of ships arriving at Tampico and the promise of greatly increased exports of petroleum this year. Tampico, which in normal times, is considered the most important seaport between New York and Rio de Janeiro, has been exceedingly quiet for the last year or so. The British, Spanish and French liners were discontinued during the war and, except for tankers, few ships put into this port.

This is changing now, for one thing the New York & Cuba Mail Steamship Company, operating the Ward line of steamers, has resumed weekly sailings and we now have a passenger and freight steamer from New York every week instead of each two weeks, as formerly. Beaumont, Texas, has a weekly freight and passenger steamer service and New Orleans has a steamer into this port about three times a month.

Recently the American Consulate dispatched 13 ships in one day and followed it up the next day with ten ships and cleared 11 the following day. Sunday 12 ships of various kinds entered the harbor. The oil companies have promise of increased tankage and the oil companies anticipate a good year for exports.

The petroleum companies are planning for increased business and increasing their facilities for handling larger exports. The Island Oil & Transport Corporation will build a second sea loading berth at its Palo Blanco terminal at Port Lobos. The material for use in construction has been shipped from the States and will be forwarded to Palo Blanco as soon as it arrives in Tampico and construction work will begin. The shipment consists of two miles of 8-inch pipe.

Besides this work the company plans to increase its tankage at Palo Blanco and will erect four more 55,000 barrel steel storage tanks. With the completion of these it will have eight 55's which will answer its requirements for the present.

The Freeport & Mexican Fuel Oil Corporation will likewise increase its tankage capacity at the company's new terminal down the Panuco river. It has made application to the Inspeccion Tecnica for permission to put up two additional 55,000-barrel tanks, which will give them eight tanks of this capacity at the terminal.

During the past year the East Coast Oil Company, pioneers in the Panuco field, completed a pipe line from the fields at Panuco to its shipping terminal at Tampico and have been pumping oil direct from the fields to its Torres terminal since last June. It was the opinion of a great many oil men that it was impracticable to pump oil of 12 gravity a distance of 25 miles economically, and without excessive pre-heating which would cause serious loss in the lighter constituents, and that the pressure required would be prohibitive. However, after preliminary tests made in pumping the Panuco oil through the short lines that had been laid for loading barges on the Panuco river, the East Coast Company completed an 8-inch pipe line from the Panuco field to the Ponce loading station, a distance of 17 kilometers. Oil was pumped from there and transferred by barges to the Torres shipping terminal until June, 1918, when the pipe line was completed from Ponce to Torres, a distance of 23 kilometers. Pipe line runs for last year total 1,525,191.12 barrels.

Form Chamber of Commerce

An American Chamber of Commerce has been organized in Tampico which includes among its officers and committeemen most of the prominent oil men of this section. C. A. Hamilton, manager of the Mexican Gulf Oil Company, is president of the Chamber. E. J. Sadler, manager of the Transcontinental Petroleum Company, is chairman of the executive committee. C. A. Miller, manager of the Texas Company, is vice chairman. There is a committee on petroleum with William Green, manager of the Huasteca Petroleum Company, as chairman, and the following committeemen: C. A. Miller, E. J. Sadler, W. H. Sharp, manager of the Freeport & Mexican Fuel Oil Company; P. M. Longan, manager of the International Petroleum Company; H. A. Ellis, manager of La Atlantica; Harry Mount, Geo. L. Christie and William Fortine.

The duties of the committee are: "To study and report upon the actual petroleum conditions in Mexico, and the volume and present conditions of American petroleum interests in the country. To ascertain the policy and plans of American owned companies. To learn what resumption or enlargement of operations has been effected or is in prospect, and what arrangements are made, or being made, to dispose of crude or refined oil either for export or interior consumption. To consider or recommend anything that may be done for the benefit of the American petroleum interests in Mexico."

Thv. Cappelen, Norwegian consul in Tampico, who returned recently from Norway where he went for the purpose of interesting Norwegian capital in the Mexican oil fields, has gone back to Norway in connection with the plans of the company. A company has been formed under the laws of Maryland to operate in the Mexican fields and preliminary arrangements made here to carry on the work. The name of the company is the Mexican Petroleum & Refining Company and they are fitting up offices adjoining the Tampico Loan & Trust Company, of which Mr. Cappelen is president. Those interested will not give out the amount of the capitalization; it is said to be anywhere from 5,000,000 to $15,000,000. At any rate they will have sufficient to carry on an enterprise of importance in this field.

P. A. L. Engelbregt arrived this week from Holland to take the management of the Corona Company, a subsidiary of the Royal Dutch Shell Company, of Holland. C. P. Visser, who has been acting manager, will be assistant manager.

Barrigan No. 2, of the Tampascos Company, is drilling at 2,032 feet.

Robles No. 3, on the Robles lease, belonging to the same company, is rigging up and will start deepening hole the first of next week.

Pablo No. 1, on lot 35, of the Transcontinental Petroleum Company, is in white shale at 1,970 feet.

Barberena No. 5, of the same company, is in lime and flint at 1,715 feet.

Isleta No. 1, on lot 21, of the Mexican Gulf Oil Company, shut down temporarily this week due to an accident to the driller. They will resume drilling next week with another driller. The depth of hole is 2,377 feet.

Cuecillos No. 1, on lot 22, San Sebastian district, of the Cia. Petrolera y Agricola Mexicana de San Jose, is running 8-inch casing.

Tamantao No. 1 on lot 2, belonging to Cosden & Wilson, is drilling at 1,875 feet.

Kerr-Mexican Company is shipping material to Panuco for a rig and camp houses. They will drill in the Tampuchi district.

Maza No. 2, on lot 2, Camalote district, of the Freeport & Mexican Fuel Oil Company, is in lime and shell at 1,951 feet.

The Texas Company's work continues shutdown.

Brings in Second Gusher

The principal event of a week ago was the big production the Mexican Gulf Oil Company obtained in its Tepetate No. 3 well, on lot 8, Tepetate. The well was brought in last Monday with an estimated daily capacity of 75,000 to 100,000 barrels. It is not known just how big a well it is as it was immediately shut in, after cleaning itself, but the Gulf field men say that "it is as big as the biggest" and this opinion is confirmed by the agent of the government's Inspecion Tecnica and oil men generally. "The biggest" in that part of the fields spouts in the neighborhood of 100,000 barrels of petroleum daily.

The Tepetate No. 3 was practically completed last August at a depth of 2,000 feet but instead of drilling it in the company set casing to the bottom of the hole and suspended operations. Last Monday drilling was resumed and when the drill had gone down but one foot the rush of gas warned the drillers that the pool had been tapped. They were able to get the tools out of the hole and then the well broke loose, spouting a solid black stream of oil high above the top of the 80-foot derrick.

The well was brought under control and closed in without difficulty and will remain shut down until the company needs the production.

This is the second gusher the Mexican Gulf Company has brought in this month, both of them being in the lower country, the home of the big wells for Mexico. The first was the Chinampa No. 2, on lot 163, Chinampa, with an estimated production of 60,000 barrels daily.

The La Atlantica Company, subsidiary of the Atlantic Refining Company of the United States, is building a big tank farm at its Guayavalittos terminal. There will be seven 55,000-barrel storage tanks and 12 smaller ones.

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Pennsylvania Operators Are Trying Out New Territory

By Special Correspondent.

PITTSBURGH, PA., Feb. 10.—Greene county, Pa., furnishes two of the most important oil wells of the past week, and there are little beyond routine completions in other fields. In some respects the recent past has been unusually uneventful in so far as adding to new production is concerned. However, all fields are fairly brisk, and there is a noticeable inclination on the part of operators to try out new territory. Probably one incentive for this situation is the apparent tendency of Pennsylvania crude oil to remain around the peak price of $4 a barrel when South Texas oils are declining.

Leasing has been on the increase in some of the lower counties of West Virginia, and as the companies are well fortified financially the coming spring should be an active one. It is now recognized that a dry hole condemns but a very small part of any territory.

Pennsylvania Results

One of the large wells of the week was the Manufacturers' Light & Heat Company's No. 5 on the Strope farm in the Isminger pool, in Richhill township, Greene county, Pa., and indications are that it will hold up at 75 barrels a day. The Little Four Oil & Gas Company obtained oil in the Springhill township field of Greene county, the pay having been encountered two feet in the Big Injun sand. The first 24 hours it flowed 60 barrels, and the second 100 barrels after it was drilled into the Big Injun sand.

The Hope Natural Gas Company, the Larimer Oil & Gas Company and the Manufacturers' Company have other tests under way in that section. Across the state line in West Virginia, the Hope Natural Gas Company's test well on the Mason farm, located in Proctor district, Wetzel county, is attracting attention, as it is showing 20 barrels a day in the Gordon sand. It is 800 feet from the same company's test on the Garner farm, and is in a section which has not been drilled over.

After many months the Red Bank pool in Clarion county, Pa., is showing a good producer; it is a 20-barrel well which the People's Natural Gas Company developed in the 100-foot sand. The People's Company has made several additional locations.

Failing to find gas after having drilled to a depth of 3,900 feet, the Philadelphia Company has abandoned its test in Highland Park, Pittsburgh. It is several miles from the gas wells in the Hazelwood district, the only places where gas was secured within the city limits. Leidecker & Company have a light pumper in the Brush Creek field, and operations are under way there for Youngblood & Gettman and McGrew & Company. The Central Oil Company is making a test on Moon Run, while Scaife & Company are drilling in Oakmont. The American Natural Gas Company is drilling in the old Glade Run district, Butler county, and Frederick & Company are making a test in the Coopertown field.

Major completions in West Virginia are of a routine character, altho the Carlile Farm Oil Company got a 65-barrel well at a Maxon sand test in the Wolf Pen Run pool, Grant district, Ritchie county, and M. F. Crawley has a 2,500,000 cubic foot gasser in the Berea grit on the Amos farm, located on Anna Mariah creek, Sheridan district, Calhoun county.

Other West Virginia wells include the following: Ira S. Cox, 15 barrels at No. 3 well on Horn Creek, Troy district, Gilmer county; Carnegie Natural Gas Company, 10 barrels at a second test on the Duckworth farm in Central district, Doddridge county; Robets Brothers, a small pumper in Wirt county; Dinemoor & Company, 10 barrels at No. 41 on the Holdren farm in Mekim district, Pleasants county; George N. Jess has a showing for a fair producer in the Cow Run sand in Lincoln district, Tyler county, the location being in advance of production; Wayland Oil & Gas Company has a small producer in its No. 3 on the Slusser farm in Greenbrier district, Doddridge county; Hope Natural Gas Company, 15 barrels at a second test on the Parr farm in Courthouse district, Lewis county; Clark Oil & Gas Company, 7 barrels at No. 47 on the Volcanic tract in Walker district, Wood county; and Carter Oil Company, 8 barrels on Miller's run, Spencer district, Roane county.

The Hope Natural Gas Company has practically abandoned its test on the Goof farm, Simpson district, Harrison county, after having drilled to a depth of 7,386 feet, making it the deepest well in the world.

Activity is rather brisk in Cove, West Union and Southwest districts, where the Pittsburgh & West Virginia Gas Company is drilling and starting 10 wells and has made the locations for 5 others. The Reserve Gas Company has made two locations in Freeman's Creek district, Lewis county. The Ohio Fuel Oil Company has tests under way on the Newlon and Hicks farms in Spencer district, Roane county. Godfrey L. Cabot got a gasser at his test in the Chapman farm in the East Bank Cabin Creek district, and he has started a wildcat on the Jones lot on Cabin Creek. The Kanawha Valley Products Company and the Columbia Carbon Company each are due on Kelley's Creek, and next week the United Fuel Gas Company should bring in two wells in Cabin Creek.

Fair-sized gassers have been developed by several companies, the Philadelphia Company having been fortunate at two tests in Church district, Wetzel county; and Guy Patterson having brought in a gasser in Liberty district, Marshall county.

The Ohio Fuel Supply Company got a fair gasser in Warren township, Belmont county, Ohio. Oil wells completed in Ohio either showed but a few barrels a day or were dry.

Restaurants on wheels to resemble the tanks used by American soldiers at the front have been designed to operate in the California oil fields, according to a report from that territory. The tanks will carry the noon-day meals of the workers.

Ohio Village Is In Throes Of Oil Boom

With 35 wells already producing between 175 and 200 barrels a day and with good prices being paid farmers for leases, Chatham, a village of 100 people in Medina county, Ohio, is having an oil boom. Twenty-five oil operators from Ohio, Pennsylvania and West Virginia have taken several thousand acres of in and around the village.

Only three wells drilled so far are dry. The operations are shallow, most of the wells striking the sand at an average of 475 feet. The oil is in the Berea sand, the strata running from 30 to 97 feet in thickness.

The Buckeye Pipe Line has run a two inch line to Lodi, a village on the B. & O., five miles to the south, where loading racks with a capacity of three cars has been erected. The supply is being taken by the Standard for delivery at their Cleveland refineries.

The biggest operators in the field, so far, are E. R. Edson & Son, of Lakewood, who have 3,000 acres under lease and who drilled in their No. 12 on the Ripley farm, February 6th. Another well, located on the Scott farm, a mile away, is doing 27 barrels a day.

According to Dr. E. J. Hill, Chatham's only physician, who has made a study of the field and has been dealing in leases, the oil comes from an anticline extending north and south thru Chatham, with a tendency to vary northeast to southwest. The field, he says, is an extension of the old Belden field, nine miles away. The anticline varies from four to five miles in width. Oil can be traced, Dr. Hill claims, for a distance of 14 miles, northeast to southwest. The field is good for many years of production, Dr. Hill and several of the bigger operators declared.

Besides E. R. Edson & Son, the bigger operators are the Ohio Fuel & Gas Company, the Wiser Oil Company, of West Virginia; Meadowbrook Oil Company, Cleveland; H. A. Dempsey, Cleveland; Hoyt Oil Company, Akron; the Agnew Oil Company, Pittsburgh; Faulkner and O'Donnell, Cleveland; and Herman and Starr of Lodi.

The field now under operation covers approximately two square miles, practically all of the wells lying west of the village. Leasing to the eastward has been very active, however, and operations will be started there soon, operators declare.

Operators said they are receiving $2.58 a barrel for their production, which has tested at 40 degrees Be. at the wells. Three of the wells in the field have shown a black oil which is bringing 80 cents a barrel less than the remainder of the crude being produced.

Operations were started in this same field two years ago, several wells being drilled and all showing dry.

Staff Special.

FORT WORTH, TEXAS, Feb. 11.—Announcement from Wichita Falls, Texas, is made by the Marine Oil Company of its sale of holdings at Burkburnett to Gilliland & Richards, of Tulsa, for $2,500,000 on terms of $1,000,000 cash, $500,000 in ten months and the remaining million out of half the production. The holdings consist of less than 200 acres in the Vancleave and Hardin tracts.

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Extinguishing Oil And Gas Fires

Bureau Of Mines Report Gives Practical Methods And Describes Apparatus Used By Oil Operators

From Bureau of Mines Bulletin, "Extinguishing and Preventing Oil and Gas Fires," by C. P. Bowie.

Herewith is published the portion of the Bureau of Mines report on methods for extinguishing and preventing oil and gas fires which deals with handling fires at oil and gas wells. There is given the practical experience of several operators in extinguishing these most difficult fires to handle. In previous issues have appeared portions of the Bureau bulletin dealing with fire prevention at oil plants generally, and dealing with the use of the so-called frothy-mixture systems in extinglishing fires of oil in storage. —Editor.

Fires at gas wells, except at wells producing large volumes of gas, are, as a rule, not particularly difficult to overcome if the gas can be confined in one stream, because if the flow can be cut off for an instant the flame will be extinguished. Control of the gas flow, however, is sometimes very difficult, as is shown by a fire at a gas well of the Standard Oil Company of California, near Taft, Cal., in July, 1916. The well was making about 20,000,000 cubic feet of gas daily and was being brought under control at the time it caught fire. A gate valve had been placed on one of the strings of casing; gas was escaping thru the gate valve and on the outside of this casing. The casing beneath the valve, owing to the heat of the fire and the weight of the valve, partly failed, permitting gas to escape laterally at high velocity thru numerous cracks. The flame was then so large that it could not be smothered with steam. In order to bring the gas into one stream again, the casing was cut beneath the gate valve with a rifle, about 40 shots being required.

When the gas flow has been confined in one stream the flame, unless it is very small, will always be some distance above the casing. The greater the pressure on the gas the longer this column of unburned gas will be. If enough steam or water can be directed against this part of the gas column to interrupt the stream of ascending gases momentarily even the largest fire will be put out. As there are no particles of blazing fluid dropping from the flame, and as the casing head and the ground in the vicinity of the well will seldom be hot enough to reignite the gas, there is little danger of the flame being rekindled. However, it is a wise precaution to thoroly spray the casing head and the ground adjacent to it with water just before the steam or water is turned onto the gas column.

Steam Method

In putting out gas-well fires with steam, the usual practice is to set up portable field boilers in the vicinity—sometimes as many as 20 are required—and surround the burning well with steam pipes. The pipes terminate in goosenecks having discharge ends so flattened as to throw a fan-shaped spray of steam against the gas column. The lines are usually screwed together at a safe distance from the well and pushed into position, or the men are protected from the heat by sheet-iron or asbestos shields, and water is continually sprayed on from all boilers simultaneously. If the volume is sufficient, a blanket or cloud of steam will be formed and momentarily interrupt the gas stream just above the head of the casing, and the fire will be extinguished.

Water Converted Into Steam

A method used on a burning gas well near Monroe, La., in June, 1917, by William Guerin, formerly of the New York Fire Department, is worthy of note. The well was estimated to be making 40,000,000 cubic feet of gas daily. For the protection of the men two shields were pushed to within a few feet of the well. Two ⅞-inch jets of water under a pressure of about 40 pounds were so directed against the column of gas immediately above the casing that they converged from an angle of about 90 degrees. The nozzles were then slowly raised until the streams played on the base of the flame. Then the men handling the hose pressed their thumbs against the nozzles, making a fan-shaped spray. The spray, on striking the base of the flame, was rapidly converted into a cloud of steam, which rose beneath the flame and put it out.

Hood Method

H. O. Ballard, of the Empire Gas & Fuel Company, has adapted the familiar snuffer principle to a portable extinguisher, which has been successfully used on small gas fires. The hood is mounted on wheels and terminates in a valve to which is attached a piece of 14-inch pipe about 20 feet long. The pipe can be extended to any desired length by screwing on more joints.

On either side of the hood, midway of its height, is a short piece of 10-inch pipe also containing a valve. The hood is taken to the site of the burning well. The desired extension is added to the 14-inch pipe, the large valve is opened, the two small valves closed. The hood is then upended over the fire by means of guy wires and block and tackle. When the hood has reached the vertical position, if the fire is a small one, the

Condition of flowing oil well, which had burned for 16 days, after fire was extinguished by discharging mud into blazing crater

First stage in operation of placing a hood made from a 36-inch stack over a burning gas well

lower valves are opened and the large one closed, thereby cutting off the flame. If the flow of gas is so strong that the discharge from the 10-inch pipes may reach the top of the stack and ignite before the large valve can be closed, the 10-inch pipes are extended to a safe distance from the well before the valves are manipulated.

This principle has also been successfully used with some very large gas fires. Max Moore, an oil operator of Tulsa, Okla., applied it in 1914 to a well which, after the fire was extinguished, was found to be producing at the rate of 500 barrels of oil and 40,000,000 cubic feet of gas daily. It so happened that the well was in a river bed, the banks being about 40 feet higher than the base of the derrick.

A wire cable was stretched from bank to bank in such a position as to pass just outside the stream of blazing gas. A hood made by riveting a funnel-shaped piece of pipe, the large diameter of which was about 5 feet, to an ordinary 36-inch smokestack, was hung from pulleys on the wire cable, drawn over the burning well, and placed in position.

The ground, rig irons, and the base of the hood were then thoroly cooled by spraying with large quantities of water. The top of the stack was then drawn over at a considerable angle and the base was quickly removed from the well, thereby cutting off the supply of gas thru the stack and extinguishing the fire.

Extinguishing Oil-Well Fires

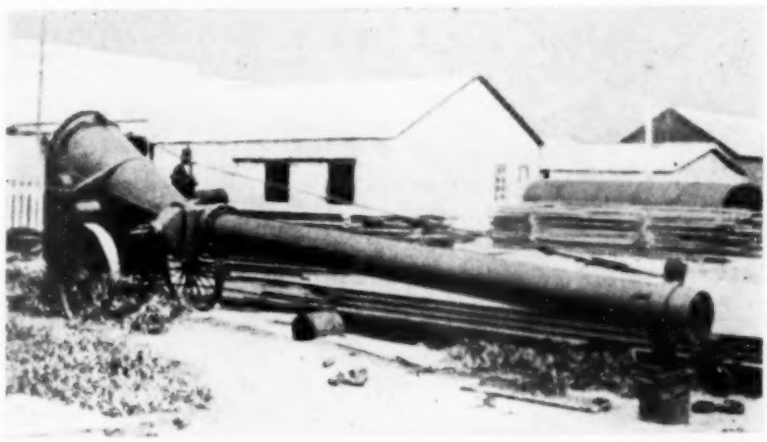
Oil-well fires are often much more difficult to overcome than gas-well fires, because the well may be producing in such large quantities that the oil is not all consumed in one tapering flame, as with gas, but may flow away in a blazing mass for a considerable distance. Also, the burning oil soon heats the ground around the well so hot that no matter how often the fire may be extinguished it will immediately reignite.

Thus, no definite rules can be given for combating fires at oil wells, as each burning well presents a problem of its own. The following descriptions of methods that have been successfully used are given, as has been stated, not with the belief that any one of these could be successfully applied to some other fire, altho it might be, but with the hope that the ideas presented may, when used singly or in combination, be of service to operators in dealing with such fires in the future.

Method Used On a Fire at a Well in Texas

C. P. Clayton, superintendent of the Producers Oil Company, gives the following account of an oil-well fire in the Humble field, Texas, which was extinguished under his supervision in February, 1916:

The well had been flowing for two days and was making about 6,000 barrels daily. It was being brought under control at the time the fire occurred, and most of the oil was discharging thru a 6-inch flow line extending about 20 feet from the head of the casing. Immediately over the well, about 6 feet



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above the derrick floor, oil was discharging thru a 2-inch opening in a 4-inch tool joint at the rate of about 100 barrels per hour. The fire was caused by an electric spark in repairing a broken power line on the derrick floor.

The well was situated in a heavily timbered country, and, as a first precaution, all timber, stumps, and other inflammable material were removed from the vicinity. Twenty-nine portable field boilers were then set up, and a network of 4-inch and 2-inch steam lines laid about the well. Also, connections were made to seven boilers already installed at near-by drilling wells, and seven 2-inch water lines were laid. While this was being done a circular levee about 3 feet high was thrown up around the well, at a distance of about 50 feet from it. Opposite the flow line a ditch 218 feet long and 4 feet wide at the top, tapering to a depth of about 4 feet, was dug, which opened into a circular ditch of about the same depth and having for its outer circumference a radius of about 75 feet. The straight ditch was then covered with corrugated iron, upon which was placed about 2 feet of earth. A piece of 36-inch smokestack was then placed in the mouth of this ditch and shoved up to within about 25 feet of the end of the flow line.

When all was in readiness, an asbestos-lined swedge nipple about 8 inches in diameter, attached to 80 feet of 3-inch pipe, was placed over the spray of burning oil discharging from the tool joint. This was done by men working from behind a corrugated iron shield. At the second attempt this part of the fire was quenched and the oil discharging at this point, or the greater part of it, was made to flow thru the 3-inch pipe. Immediately the steam and water was turned on the blaze at the end of the flow line (the men advancing behind shields) in such a manner as to drive the flame into the mouth of the 36-inch stack and extinguish it. The men protected their hands with gunny sacks and asbestos shields, and streams of water were continually sprayed upon them as they advanced. The preparatory work required about 17 hours; the actual quenching of the flames about 15 minutes.

Another Method

Mr. Clayton also describes a method used by him to extinguish an oil-well fire in Caddo Parish, La., in 1911. This well burned 26 days, 2 hours and 10 minutes, and when the fire had been put out, a gauge record showed a production of 48,000 barrels daily. The discharge was so great that the oil was not all consumed until some of it had flowed a distance of more than 100 feet from the well.

Thirty-six boilers were erected and the fire fought with steam for six days, but without success. At the end of this time this method was abandoned and a circular levee about 3 feet high and 200 feet in diameter was thrown up around the well, which formed a pond of blazing oil in which all the flow was consumed.

The well being on a hillside, a tunnel 4 by 6 feet by 328 feet long was driven, striking the outer casing at a point 18 feet below the surface, measured to the center of the face of the tunnel. The well contained three strings of casing, 10-inch, 8-inch, and 6-inch. A split clamp was placed around the 10-inch casing, and to this was attached

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a string of 6-inch pipe extending beyond the mouth of the tunnel. An especially constructed 4-inch bit was made from a case-hardened nipple. This bit had in one side a hole 2 inches square and was screwed onto the end of a string of 4-inch pipe; the joints of the pipe after being screwed tightly together, were also riveted. This string was placed inside the 6-inch pipe and was fitted on the outer end with a cap and a sprocket wheel to which was attached a rotary chain drive. A deadman was set opposite the end of the pipe and a jack set between it and the cap.

The chain drive was then set in motion and a hole drilled thru the casings. Careful measurements were kept on the jack as the 4-inch line advanced, so that the opening in the bit would be stopped as nearly as possible in the center of the 6-inch casing. When this point was reached, the bit was turned so that the hole was "looking" down into the well. A circulating pump was connected with the 4-inch pipe and asbestos shavings forced thru it under a pressure of 1,200 pounds per square inch. After this had been done for a few minutes the pipe was so turned that the hole in the bit was on top and the flow of the well was shut off. The oil on the surface, inside the levee was soon consumed and the fire extinguished from lack of fuel.

In discussing this method, Mr. Clayton states that the tunnel, where it intersected the casing, was too near the surface. He thinks the distance should have been at least 30 feet, as several of the men, in placing the split clamp, were almost overcome by the heat and gas fumes.

M. E. Lombardi, superintendent of construction of the fuel-oil department of the Southern Pacific Railroad, describes an oil fire extinguished under his direction which occurred in the Midway oil field, California, in 1913.

The well had been drilled by the rotary system and caught fire just after it had unexpectedly started flowing, so the rotary table was still in place. After the floor of the derrick had burned the table crumpled the end of the casing, which extended several feet above the ground, until the table rested on the ground. This formed a baffle and the oil spurted out laterally with such force that before long a crater about 50 feet wide by 40 feet deep was formed.

A large number of field boilers were set up near the well and the usual method of applying steam and water resorted to. The fire was repeatedly extinguished, but the sides of the crater had become so hot that the gas and the oil were reignited as soon as the blanket of steam lifted.

The well was on a hillside and the soil was a heavy clay. A pit about 50 feet in diameter and 3 feet deep was dug in the hillside about 200 feet from the well and about 30 feet above it.

In this pit mud was mixed, fluid enough to flow freely, and the mixture was discharged into the blazing crater. The pit was filled and emptied three times in quick succession. The third application permanently extinguished the flames, the steam formed by the drying mud cooling the walls of the crater below the point where they would reignite the oil.

The fire burned 16 days and, when finally conquered, the well was found to be flowing at the rate of about 1,000 barrels daily.

Would Force Texas Motorists To Pay Premium On Gasoline

Staff Special

FORT WORTH, Feb. 10.—The state legislature will probably be presented in the near future with a bill specifying what shall be sold in the state under the name of gasoline, the effect of which, if it becomes a law, will be to penalize auto owners of that state at least two cents a gallon in the price they will pay for their motor fuel this season. Such a bill has already been drawn by Senator Bailey.

The bill specifies a distillation test for all gasoline sold in the state which can only be met by a 60 or 61 Oklahoma product. It calls for a final boiling point of 428 Fahr. Last season the average dry point of motor fuel sold in this country was up around 500 Fahr. This season with the unprecedented demand that is coming the final boiling point will be 500 degrees and over, particularly in the southern and western parts of the country.

If the bill becomes a law the oil companies will be forced to market an unnecessarily high grade of gasoline there, and Texas motorists will have to pay the difference between the cost at the refinery of manufacturers standard grades of motor fuel and the cost of producing this higher grade. In addition to specifying the boiling points of gasoline, the bill also provides for the inspection of gasoline pumps, stating that they must register correctly at three speeds, fast, slow and medium.

As regards kerosene, the bill provides that nothing that flashes at less than 110 Fahr. shall be marketed in the state as this product.

The bill provides for the enforcement of its various statutes by the Pure Food and Drug Commissioner. The text of the bill in full is as follows:

Text of Bill

Section 1. That all gasoline, benzine, naptha or other like products of petroleum under whatever name called, used for illuminating, heating or power purposes, shall be sold under their true name and shall be deemed to be subject to inspection and control by the proper authorities.

Sec. 2. That all packages containing gasoline, benzine, naptha or other highly inflammable substances made from petroleum must be plainly marked in accordance with regulations of the Interstate Commerce Commission; that every tank car, barrel, cask, tank-wagon, receptacle or reservoir in which petroleum products shall be shipped or stored within this state or from which sales or deliveries of the same are to be made shall be truly labeled in large letters showing the name of the manufacturer and the place of manufacture or production.

Sec. 3. Only such products of petroleum as will not flash at a less temperature than 110 degrees Fahrenheit may be sold for illuminating purposes.

Sec. 4. For the purpose of this act, the word gasoline, whether used alone or in connection with other words, shall apply only to the petroleum products complying with the following minimum requirements:

(a) Boiling point must be higher than 60 degrees Centigrade (140 degrees Fahrenheit).

(b) Twenty per cent of the sample must distill below 105 degrees Centigrade (231 degrees Fahrenheit).

(c) Forty-five per cent must distill below 135 degrees Centigrade (275 degrees Fahrenheit).

(d) Ninety per cent must distill below 180 degrees Centigrade (356 degrees Fahrenheit).

(e) The end or dry point of distillation must not be higher than 220 degrees Centigrade (428 degrees Fahrenheit).

(f) Not less than 95 per cent of the liquid will be recovered from the distillation.

(g) Gasoline to be high grade, refined and free from water and all impurities, and shall have a vapor tension not greater than ten pounds per square inch at 100 degrees Fahrenheit temperature.

The apparatus and methods of conducting all tests shall be that described and authorized as official by the United States Bureau of Mines, provided such methods and standards from time to time shall be revised and amended to conform with modern discoveries and scientific research.

Sec. 5. All scales, measures or measuring devices, used in the handling or sale of petroleum products must be true and accurate. Pumping devices must be correct at three speeds, fast, slow and medium.

It shall be the duty of the inspector to seal and forbid the use of any grossly inaccurate measuring devices, until such time as the defect is corrected. The breaking of said official seal shall be prima facie evidence of a violation of this act.

Sec. 6. The Food and Drug Commissioner, his inspectors or any person duly appointed by him for that purpose, shall make complaint and cause proceedings to be commenced against any person for the violation of any provision of this act, and in such case he shall not be obliged to furnish security for costs; the Food and Drug Commissioner, or his inspectors or any person by him duly appointed for that purpose shall have in the performance of their duties all the rights and privileges of a peace officer with power to enter any factory, store, salesroom or place where he has reason to believe petroleum products are made, prepared, stored, sold or offered for sale or exchange, take samples, test measuring devices, examine the files and books of such places, stores or factories.

Sec. 7. Any person who shall willfully hinder or obstruct the Food and Drug Commissioner or his inspectors, or other persons by him duly authorized in the exercise of the power conferred upon him by this act, shall be deemed guilty of a misdemeanor and upon conviction shall be punished by a fine of not less than $25 nor more than $200.

Sec. 8. Any person who shall violate any of the provisions of this act shall be deemed guilty of a misdemeanor and upon conviction shall be fined not less than twenty-five (25) dollars nor more than two hundred ($200) dollars, or be imprisoned in the county jail for not less than one month nor more than one year or punished both by such fine and imprisonment in the discretion of the court.

Montana May Legislate Garage Man Out Of Gasoline Business

By Special Correspondent.

HELENA, MONT., Feb. 9.—Efforts by the Montana legislature to eliminate the garage man—the middleman—in the transaction of selling gasoline, will result, it is predicted by a high official of one of the largest oil companies of the state, in putting many garages out of business and consequently increase the cost of operating motor vehicles.

A special joint committee with three members from the Senate and the same number from the House was authorized by the adoption of a resolution by Senator Booth, of Fallon county, and has for its purpose the investigation of the high cost of living in the state. The Senate named Senators Lowe, of Sheridan county; Healy, of Park county, and Booth, of Fallon county, while the House appointed Representatives Higgins, of Missoula county; Muth, of Lewis and Clark counties, and Sinclair, of Flathead county.

The prices of gasoline and lubricating oil were the first items taken up by the committee. Under its authority to subpoena witnesses, J. M. Power, treasurer of the Montana Oil Company at Helena; L. T. Cramer, traffic manager of the same concern; J. J. O'Neill, of Butte, state manager of the Continental Oil Company, and others were summoned and testified at a hearing behind closed doors.

Gasoline prices at the refineries were probed. It was pointed out by witnesses that at the refineries of Kansas, Oklahoma and California gasoline was then selling at 17½ cents a gallon and at 20 cents a gallon at the Wyoming refineries. Montana dealers, it is said, get their supply from Wyoming.

Wholesale prices for gasoline in Montana are quoted as 26½ cents a gallon at Billings and 28½ cents a gallon in the northern part of the state, prices in other localities conforming to their approximity to the places given. Retail prices vary, but are said to be from 40 to 50 per cent above the wholesale figures.

Would Establish Stations

While it is said to be impossible to legislate the garage men out of business so far as selling gasoline is concerned, the committee, it is understood, advocates the establishment of filling stations generally thruout the state. This, it is said, if carried out, will have the effect of putting the wholesale oil companies, like the Montana Oil Company and the Continental Oil Company, to some extent, into the retailers' class, by requiring them to sell in much smaller quantities and at increased cost of delivery.

Under the present system of doing business, it is pointed out, the wholesalers sell to the garages, which are to be found in the smallest villages in the state, and act as distributing agencies for gasoline and lubricating oil for the motor users of the rural districts.

The committee went only slightly into the price of lubricating oil, altho the profit on it is greater than on gasoline, according to the wholesalers, who declare that

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the margin of profit on gasoline is so small that it is only in the volume of business they transact that they are able to make any money. The lubricants, they say, help pay for the expense of handling gasoline, both in the case of the wholesaler and the retailer.

At this hearing of the legislative committee Helena garage men testified, according to members of the committee, that the price of gasoline is higher in Montana than it is in many other states because of the higher wages paid in this state, $150 a month being paid auto mechanics, while in many other states the pay amounts to only $90, and to meet this difference greater profits are required.

Figures given the committee by the garage men showed that they were selling on an average of 350 gallons of gasoline a day, which, with a five per cent profit, would enable them to make $525 a month. Prices are arranged, it is understood the committee was told, each day over the telephone. During the last summer the Helena garage men, according to their testimony, bought gasoline at 29¼ cents a gallon and sold it for 33 cents.

Complaint as to freight bills is said to have been made to the committee by the jobbers, one grievance being that the Wyoming refineries would only quote prices f. o. b. for Montana points.

Nothing has developed in the situation since the committee held this hearing, but it is understood that a bill drafted by the committee for the regulation of the gasoline and oil business in the state will be introduced in the legislature very soon.

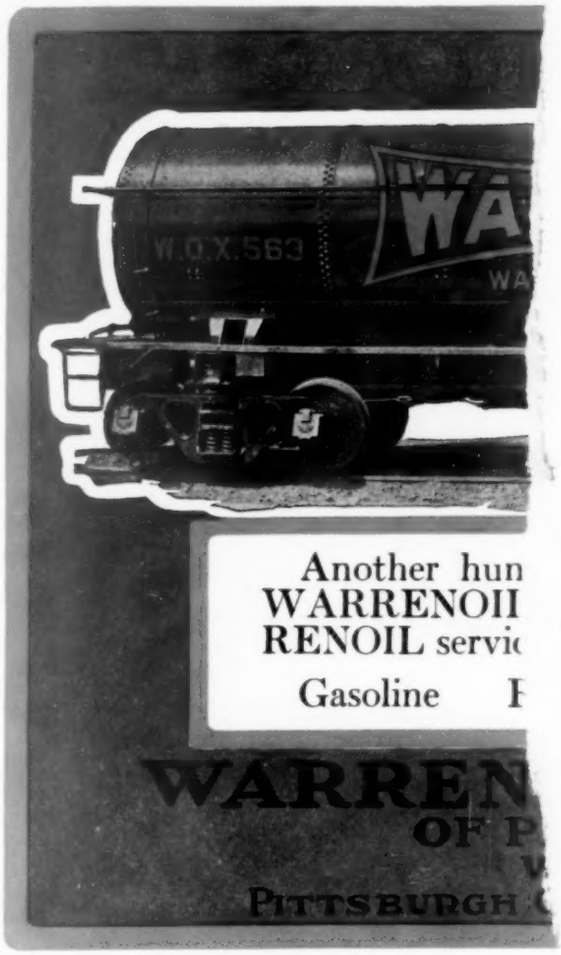
Began Six Months Ago

The investigations of the committee are probably the outcome of a movement that started six months ago to determine the cause of the high price of gasoline in Montana. The movement was greatly agitated in the press and attracted widespread attention in Montana, state officials taking part in an effort to solve the question. The difference between Montana prices and those in other states was pointed to, but at length the problem hung itself on the matter of high freight rates to Montana points.

During the current probe by the legislature joint committee Chairman Booth has invited the public to present any evidence it has regarding the high cost of living, in the matter of gasoline prices as well as to other things, but it has not been reported that anyone has yet appeared before the committee for this purpose, except persons subpoenaed to appear.

The three oil companies doing the biggest business in this state are the Continental Oil Company, the Montana Oil Company and the Mutual Oil Company. The Continental concern is said to have 175 stations in Montana and the other two companies 40 stations each.

Announcement of a number of changes in their organization has been made by the Stoddard Oil Company. M. M. Fletcher, formerly with the New York office, has opened an office for the company at 706 Marsh Strong building. Los Angeles, where he will look after the company's interests on the coast. The Pittsburgh office has been moved to Warren, Pa., and will continue in charge of W. H. Ainsworth. David E. Duff has joined the sales department of the New York office. He was formerly with the Texas Company.



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Baltimore (Curtis Bay), Md.
Philadelphia (Marcus Hook), Pa.
New York Harbor—Bayonne
Providence, R. I.
Portland, Me.

WHAT'S WHAT - IN CHICAGO - WHO'S WHO

New Plant Is To Be Ready In 7 Months

By Special Correspondent

CHICAGO, Feb. 11.—W. H. Miller, general traffic manager of the Indian Refining Company, of New York, was a visitor at the local offices here this week, returning Friday. E. L. Van Buren, manager of the Chicago district, spent several days in Detroit inspecting the company's new plant there, opened up for business last week. His purpose there was to get some ideas that would be available for use at the new Chicago plant, for which ground was broken this week.

The same workmen employed at the Detroit plant are on the job now in Chicago and with their experience are expected to complete the plant here inside of seven months so that all of the new quarters can be occupied by January 1, 1920. The office structure will be finished by or before May 1, to which the downtown offices will be removed.

To be prepared for a greatly enlarged business the company has purchased and expects to receive next week six new Auto-car delivery motor trucks, besides one large State truck. It is expected that the new plant will cost between $200,000 and $250,000 when completed.

J. A. Anderson, of Anderson & Gustafson, has been in Pittsburgh and Cleveland for several days this week, and on his return will leave for Oklahoma and Texas in the interests of the firm. R. J. Curtis, who for a number of months has been stationed at the Chicago office, originally coming from the New York office, returned early in the week to resume active management of the eastern office. Walter G. Johnson, of the Chicago office, who has been training for a commission at Camp Taylor, Louisville, Ky., has been released from service and has been sent to the Tulsa office of the firm. Three other employees of the Chicago office, two of whom have been in the navy and one in the army, have been released and have resumed their former positions at the Chicago office.

Clifford Thorne, general counsel for the American Petroleum League and commerce counsel for the Western Pe-Refiners' Association, returned from an extensive trip thru the south and southwest on Tuesday and left for Washington on interstate commerce matters, expecting to be gone several weeks.

Following the closing up of its filling station business here, H. C. Meyer, of Pittsburgh, general sales manager of the Riverside Oil Company, of Illinois, has announced that its activities will be confined strictly to a tank car business, which will be in charge of C. F. Mercer as heretofore.

Carl O. Beroth, president of the reorganized Acme Petroleum Company, returned early this week from a short trip to Dallas and the Texas producing fields.

Advices have been received here that the North Dakota legislature is attempting to pass a bill taxing all oil companies located or doing business in that state 5 per cent of their gross sales. The matter is now being discussed at the present session of the legislature and representatives of the American Petroleum League will strongly oppose the proposed measure.

Walter G. Willard, assistant secretary of the American Petroleum League, who has been absent from local headquarters for a month or more in the interests of the organization, is preparing to return from Texas, where he now is, to Chicago next week. He sends in reports that large delegations of oil men have signified their intentions of attending the coming Petroleum Congress here next month.

Chicago Visitors

Among the visitors this week were Leon Thevelin, of the Continental Refining Company, Bristow; Walter Anderson, of the Winona Oil Company, Winona, Minn.; T. P. Caldwell, of the Imperial Refining Company, Ardmore; John Cameron, of the Imperial Refining Company, and J. P. Howe, of the Manhattan Oil Company, Des Moines, Ia. Mr. Howe remained here for a few days and then left for Florida, where he will spend a short vacation.

D. V. Buchanan, of the Ozark Oil & Gas Company, of Tulsa, is in the city this week making arrangements to open up an office, which is to be in charge of A. L. Hasse.

S. X. Willard, formerly of the Willard Petroleum Company, but recently in government service "over there," returned from Pittsburgh, where he had spent several days arranging to represent the Biery Oil Company at its western office.

S. B. Adler, of the Chas. F. Garrigues Company, of New York City, and well known to local oil men, was an early visitor this week, calling at the local office in the Lumber Exchange. The company expects to open large offices here and Mr. Adler will assist in making arrangements. He will be here about ten days, returning by way of Pittsburgh.

Standard Man Killed

CHICAGO, Feb. 10.—Lieut. A. S. Tarnoski, formerly connected with the Standard Oil Company of Indiana, in its Chicago office, has been reported killed in an airplane accident on January 7th.

He had written home to his mother here on January 5th, saying that the gladdest sight possible would be when he could salute the Goddess of Liberty. Lieut. Tarnoski, a graduate of the University of Illinois, enlisted over a year ago, winning his commission in the field artillery, being transferred in France to the signal corps as an observer in the 354th aero squadron.

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REFINERY, TANK WAGON MARKETS

May Adjust Chicago Snarl

IT is fairly confidently to be expected that the Chicago tank wagon situation will soon be readjusted, and in a way that will remove the present bone of contention and establish a general marketing practice that will be recognized over the entire country. Such a plan is in Oil Director Requa's hands now, and the general belief is that it will be promulgated by virtue of the authority still resting with the Fuel Administration. Further details can not be given at present.

Inaugurate a Good Practice

The notice of many western refiners to producers whose oil they are taking to the effect they will discontinue paying premiums over the posted market price, starting February 15th, should not be taken as an indication of weakness in the crude situation. Instead it should be regarded as a wise step which has often been urged upon the refiners, and which can be undertaken to better advantage now than before. The further reduction of the heavy Texas and Louisiana crudes likewise can not be taken to indicate over-production of gasoline crudes.

Forsee Gasoline Shortage

That this country before the summer will need every gallon of gasoline that the refining plants can turn out is more than ever evident to those who have studied the reports on the general oil situation in this country that were presented before the motor fuel session of the Society of Automotive Engineers in New York. It was there shown that motor fuel demand last year reached a point where it was greater than could be supplied by gasoline taken from the crude production by ordinary distillation methods. Even this year the industry must have greater recourse to cracking processes and more efficient refining methods if the demand is to be supplied.

Cylinder Stocks Only Strong Factor In East

By Special Correspondent

PITTSBURGH, Feb. 11.—The refinery market in this section remains lethargic, save for cylinder stocks, which are still strong and moving in fairly good volume. Buying of oil products is still noticeable by its absence even at shaded prices as compared with a week or so ago. Sales of fuel oil have been reported as low as 4 cents in cases where a refiner's storage was full and the important and only consideration was to move the stuff. This figure has not been confirmed, however. Most plants are still holding their figure at around 5½ cents.

The government is pretty much off the market for all products, as far as can be learned. Apparently nothing more has developed from its inquiry as to fuel oil prices for delivery at Atlantic and Great Lakes points made about two weeks ago.

Gasoline prices have been fractionally reduced over the past week, but even such concessions have not brought buyers onto the market. It is generally felt that this holding off on purchases is due to a psychological condition making itself felt over the country generally in trading in all commodities, and brought about by uncertainty prevailing as to what the immediate future holds. That there will be the greatest demand for gasoline and motor oils this season that the trade has ever known is unquestioned. What the situation needs is for some factor to break the ice and bring about a resumption of general industrial purchasing.

There is about as little movement in neutral oils as in naphtha and gasoline, altho prices are about as favored as can be expected. Some stuff is moving at lower than quoted prices, but in cases where it is deemed necessary to move the stuff at a real sacrifice to the refiner.

Buying of lubricating stocks continues, and as far as can be learned is coming from the larger eastern houses with the ultimate object of using it in the export business. No export business of any consequence is being reported as yet, however. A certain amount of the stuff is going into the manufacture of cheap grades of motor and tractor oils, but not enough to cause its present strength at the refinery, it is conceded.

There is but little demand for wax and it is being offered for New York delivery at 8½ cents.

The Empire Refineries, Inc., announce the opening of an office at 403 Park building, Pittsburgh. The new ofice is in charge of E. F. Lalk.

Await Upward Turn In Okla. Gasoline Prices

Staff Special.

TULSA, Feb. 11.

The gasoline market this week struck a low mark that students of the marketing situation here believe marks the bottom point of the long decline that has been in progress since shortly after the signing of the armistice in November, with the following cancellation of big war contracts.

It is the general belief that from now the tendency of the market will be upward, culminating in an unprecedented demand as soon as the motoring season and the plowing season are in full swing. So convinced are some of the larger marketers and buyers that prices have reached their lowest ebb that they are counseling their jobber customers and clients to buy big now, filling their storage at the price prevailing to meet the big demand that they are sure is coming as the spring season advances.

The jobbers are not purchasing particularly heavily, nevertheless. This is believed to be partly due to the fact that they are holding off hoping for still lower prices and partly to the fact that many of the refiners are unwilling to make contracts for longer than 30 days with the air full of rumors that the posted price of crude is to be cut down in the near future. This report remains merely a rumor, but is exciting much speculation here.

Kerosene demand is firming considerably, due in large degree to export demand and the market is a shade higher than a week ago. Fuel oil remains absolutely dead and the general feeling among refiners and marketers is that no great stiffening of the market is to be expected before next fall, by which time American and foreign industries will have returned to something like normal production.

The fuel oil market is so soft that many of the refineries are finding it cheaper to run their plants on their own fuel oil than to buy coal and are disposing of practically all their output in this way. Considerable apprehension is still felt in refining and marketing circles here over the possibility that the price war now on in Chicago between the Standard of Indiana and the Texas Company may be extended to cover the whole of the nine states in which the Standard of Indiana operates.

W. T. Crotzer, formerly eastern manager at New York for the Stevens Grease & Oil Company, is now western manager for the company at Kansas City, Mo. He succeeds J. R. Battenfeld.

Two new men have been added to the Chicago sales forces of the Western Petroleum Company, Messrs. Crandall and Raferty. Mr. Crandall comes from the Sinclair Refining Company, and Mr. Raferty from Armour & Company.

Export Market Awaits Return Of Tank Vessels

By Special Correspondent

NEW YORK, Feb. 10. — Gradual restoration of the regular foreign petroleum trade is being effected by the turning over of the tanker fleet as the purposes for which the vessels have been maintained under government direction are fulfilled but reports of the different companies indicate considerable variance on the number of tankers now available for commercial uses. A very gratifying proportion of the Standard fleet has been restored, but other companies find their export operations seriously curtailed by the continued tied-up state of tanker service, and the uncertainty of definite relief is deplored as complicating arrangements for prospective shipments.

There are still a number of claims for government operation of bulk oil carriers, and so long as the process of demobilization from the foreign fields is in effect, this control, it is believed, cannot be entirely relaxed. Gasoline is still playing an important part in this work, and it is significant that regular export quotations for the lighter distillates, which were withdrawn on May 31, 1918, have not yet been restored. There have been intimations that some sort of government supervision might be maintained over the distribution of foreign petroleum shipments for the building up of normal supplies in the countries involved in the war, but the local companies are strongly of the opinion that this can be accomplished fully as creditably by the regular course of procedure under unrestricted operation of the tank fleet.

The keenness of foreign buyers to establish their markets on a sound basis of supply again is shown in the increasing number of orders from the principal European countries, with illuminating oil and gasoline commanding the most favorable attention. Even where shipping facilities have been freest, it has been found impossible to maintain shipments on a satisfying basis. Engagement of outside carriers shows a relaxing tendency but does not begin to relieve the general situation to a material extent.

There has been no change in export quotations since the advance of one cent on refined oil in all containers January 28. What had been of dominating effect upon the course of the export market last year, namely, the upward cost of containers, was apparently no factor for the recent change; rather may it be accounted for by the heavier volume of export business, with probably some difficulty in securing adequate supplies of Pennsylvania crude of contributing effect. The significance of the foreign trade movement would seem to be borne out by a shortage of refined oil lately experienced in the local domestic market. The open winter, however, has kept within moderate bounds the consumption of kerosene in the east, and expectations of a record season have not been made good.

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Refinery Markets, All Products

Following are the average market prices on the more important petroleum products in cents per gallon f. o. b. refinery in both Oklahoma and Pennsylvania. These are actual prices at which the bulk of each product is moving from the refineries at the present time. Anyone having knowledge of different prices which have obtained on any considerable quantity of any of the products mentioned will greatly favor us by advising us at once.

Prices effective Feb. 11

GASOLINE AND NAPHTHAS	Prices Feb. 11
Pennsylvania	
54 Naphtha	17½-18
58 Naphtha	19-19¼
60 Straight-run gasoline	20-20¼
62 Straight-run gasoline	21-21¼
64 Straight-run gasoline	23½-23¾
68 Straight-run gasoline	26-26½
60 Blend	20-20½
64 Blend	21-21½
68 Blend	21½
Oklahoma	
50-52, 450 end point	14½
52-54, 450 end point	14¾
54-55, 450 end point	15
56-57, 450 end point	16½-16¾
58-59, 430 end point	16¾-17¼
60-61, 400 end point	17
62-63, 375 end point	19½-20
64-66, 365 end point	21½
80-84 Raw Casinghead	23
68-70 Blend	19-19½
66-68 Blend	18½-19
60-62 Blend	16¾-17¼
58-60 Blend	16¾-16¾

BURNING OILS	
Pennsylvania	
47 Water White	9¾
48 Water White	10¾-10½
300 Burning Oil	11½-11¾
Oklahoma	
42-43	7-7¼
44-46	9¼-9¾
42-43 Distillate	6½-6¾

NEUTRAL OILS	
Pennsylvania	
200 Vis. No. 3 Assoc. Filt	25
180 Vis. No. 3 Assoc. Filt	23
150 Vis. No. 3 Assoc. Filt	20¾
Oklahoma	
100 Vis. No. 2 Color	10½-11
200 Vis. No. 3 Color	20½-20½
160 Vis. No. 4 Color	17½
200 Vis. No. 4 Color	18½-18¾
200 Vis. No. 5 Color	16½-17

CYLINDER STOCKS	
Pennsylvania	
600 Steam Refined	21½-21¾
650 Steam Refined	22¾-23
635 Steam Refined	21¾-22
600 Flash	23¾-24
600 Amber Filtered	28¾-28½
600 Medium Filtered	38½-39

WAX	
Pennsylvania	
122-124 White Crude Scale Wax, N. Y., lb.	8½
124-126 White Crude Scale Wax, N. Y., lb.	9
Oklahoma	
122-124 White Crude Scale Wax	9

FUEL OIL	
Pennsylvania	
38-40 Fuel Oil	5½-6
40-42 Fuel Oil	5¾-6
Oklahoma	
24-26 Fuel Oil, per bbl., Cleveland delivery	$1.00
28-30 Fuel Oil, per bbl., Cleveland delivery	$1.10
30-32 Fuel Oil, per bbl., Cleveland delivery	$1.20
Fuel Oil, buyers' cars, bbl	$1.00

Refiners' and Jobbers' Supplies

Following are the average market prices for the week on the principal materials used by refiners and jobbers, f. o. b. shipping point as effective Jan. 28, 1919.

Refiners' Supplies	Feb. 4	Feb. 11
Soda Ash	$3.50 cwt.	$2.75 cwt.
Silicate of Soda	2.00 cwt.	2.00 cwt.
Sal Soda	1.75 cwt.	1.75 cwt.
Caustic Soda	4.75 cwt.	3.75 cwt.
Jobbers' Supplies		
Degras Oil	60c gal.	60c gal.
English degras	15c lb.	15c lb.
Domestic degras	27c lb.	27c lb.
Chloride of Lime	2½c lb.	2½c lb.
Horse Oil	18c lb.	18c lb.
Lard Oil—		
Ex winter strained	$1.42 gal.	$1.43 gal.
No. 1	1.07 gal.	1.08 gal.
Extra	1.37 gal.	1.38 gal.
Extra No. 1	$1.19 gal.	1.20 gal.
No. 2 Lard	1.05 gal.	1.06 gal.
Tallow Oil	1.27 gal.	1.28 gal.
Neatsfoot Oil—		
Pure	$2.02 gal.	$2.03 gal.
Extra	1.19 gal.	1.20 gal.
No. 1	1.07 gal.	1.08 gal.
Menhaden fish oil	1.40 gal.	1.25 gal.
Whale oil	1.40 gal.	1.30 gal.
Soya bean oil	16½c lb.	16½c lb.
*Rosin oil, 1st run	70c gal.	70c gal.
*Rosin oil, 2nd run	72c gal.	72c gal.
Linseed oil	1.47 gal.	1.48 gal.
**Turpentine	69c gal.	66½c gal.
Pine Tar—		
Kiln burnt oil, bbls		$15.00
Retort oil, bbls		$17.00

*F. O. B. barrels, shipping point.
**Savannah, Ga., market.

CHICAGO, Feb 10.—A more optimistic feeling prevails in the local market this week for it is felt that, despite the fact that fuel oil has reached the low point of 80 cents, Santa Fe cars, there is a firmer tone. There is plenty of business to be had, according to general comment, but the main question is one of price, and until the refiners get together on their quotations, it is said no general stability can be expected. However, according to general comment, prospects are of a good business opening up in the very near future.

Ten acres of land have been purchased and negotiations are now said to be under way for the erection of a gasoline plant at Carrollton, Ohio, by Sloan & Zook, refiners and marketers, of Bradford, Pa. The new business will be operated by a separate corporation to be known as Sloan & Zook of Ohio. A private railroad switch with a loading capacity of 20 tank cars is included in the plans.

Crude Oil Quotations

Crude Prices

Quoted by the predominating pipe line companies in each field. All prices are at the well in barrels of 42 gallons.

The first change in crude oil prices for this year came Jan. 14 when the price of Caddo heavy crude in the Louisiana fields was reduced from $1.55 to $1.25 a barrel and all grades of Gulf Coast crudes were reduced from $1.80 to $1.50 per barrel.

Effective Feb. 4 Caddo heavy was again reduced, making its present price $1.00 a barrel and south Texas grades were reduced to $1.25 a barrel.

These grades had been at the higher prices since early in August, 1918, when they were fixed at those figures by Oil Director Requa. These grades are used principally for fuel oil, and the weakness of the market at present for this particular product led to their being marked down. Lower prices had been expected following the notice of the pipe line companies to operators in the new Pine Island field in Louisiana a few weeks ago that no more of their crude could be taken under present conditions.

EASTERN FIELDS

Prices

	Feb. 11 1919	Jan. 1, 1918	Jan. 1, 1917
Pennsylvania	$4.00	$3.75	$2.85
Cabell	2.77	2.73	2.22
Wooster, O.	2.58	2.38	1.80
Corning	2.85	2.80	2.25
North Lima	2.38	2.08	1.58
South Lima	2.38	2.08	1.58
Indiana	2.28	1.98	1.43
Princeton	2.42	2.12	1.62
Somerset	2.60	2.55	2.05
Ragland	2.32	1.20	.95
Illinois	2.42	2.12	1.62
Plymouth	2.33	2.03	1.53
Canadian Petrolia	2.78	2.48	1.98

MID-CONTINENT

Kans.-Okla.	$2.25	$2.00	$1.40
Healdton	1.45	1.20	.75

TEXAS FIELDS

North Texas

		Jan. 1, 1918	Jan. 1, 1917
Electra	$2.25	$2.00	$1.47
Henrietta	2.25	2.00	1.40
Corsicana light	2.25	2.00	1.40
Corsicana heavy	1.30	1.05	.75
Strawn	2.25	2.00	1.40
Moran	2.25	2.00	1.40
Ranger	2.25	....	....

Gulf Coast

Spindletop	$1.30	$1.05	$ .90
Goose Creek	1.25	1.00	....
Sour Lake	1.25	1.00	.90
Humble	1.25	1.00	.90
Batson	1.25	1.00	.90
Saratoga	1.25	1.00	.90
Dayton	1.25	1.00	.80

LOUISIANA FIELDS

Caddo, above 38°	$2.25	$2.00	$1.50
De Soto, above 38°	2.15	1.90	1.40
Caddo, 35°	2.15	1.90	1.40
Caddo, 32°	2.10	1.85	1.35
Caddo, heavy	1.00	1.00	.85
Crichton	1.75	1.50	1.10

Wyoming

Elk Basin	$1.85	....	$1.85
Grass Creek	1.85	....	1.75
Big Muddy	1.50	....	1.40
Salt Creek	1.50	....	....

CALIFORNIA

San Joaquin Valley Fields

Kern River, Midway Sunset, McKittrick, Lost Hills-Belridge, Coalinga.)

14 deg. to and including 17.9 deg. $1.23

18 deg. to and including 18.9 deg. 1.24

and for each increase in gravity of one (1) full deg. above 18.0 deg. gravity, to and inclusive of 29.4 deg. gravity, one (1) cent per barrel additional.

25 deg. to and including 25.9 deg. $1.32

and for each increase in gravity of one (1) full deg. above 25.0 deg. gravity up to and inclusive of 36.9 deg. gravity, two (2) cents per barrel additional.

37 deg. to and including 37.9 deg. $1.57

and for each increase in gravity of one (1) full deg. above 37.0 deg. gravity three (3) cents per barrel additional.

Whittier-Fullerton and Santa Maria Fields

Crude from these fields is quoted the same as for San Joaquin Valley Fields above, except the lower gravity crude purchased is 16 degrees.

Ventura County

25 deg. to and including 25.9 deg. $1.32

and for each increase in gravity of one (1) full deg. above 25.0 deg. gravity, up to and inclusive of 36.9 deg. gravity, two (2) cents per barrel additional.

37 deg. to and including 37.9 deg. $1.57

and for each increase in gravity of one (1) full deg. above 37.0 deg. gravity three (3) cents per barrel additional.

Tank Wagon, Service Station Markets

Standard Oil Company's service station and tank wagon quotations on gasoline and tank wagon price for kerosene in cents per gallon.

	Gasoline Tank Wagon Feb. 11	Gasoline Service Station Feb. 11	Oil Tank Wagon Feb. 11
EASTERN POINTS			
New York	24.5	26.5	12.5
Baltimore, Md.	22.5	24.5	9.5
Boston	25.5	27.5	12.5
Philadelphia	24.3	27	13
Newark, N. J.	22.5	24.5	9.5
Atlantic City, N. J.	22.5	24.5	9.5
Buffalo	23.5	25.5	11.5
Pittsburgh	24.3	27	13
Cleveland	25.5	25.5	13.5
Annapolis, Md.	22.5	24.5	10.5
Washington	22.5	24.5	10
Richmond, Va.	23	25	10.5
Danville, Va.	23.5	25.5	12
Roanoke, Va.	23.5	25.5	11.5
Petersburg, Va.	23.5	25.5	11
Burlington, Vt.	25.5	27.5	12.5
Charleston, W. Va.	23.5	25.5	12
Keyser, W. Va.	23.5	25.5	11.5
Parkersburg, W. Va.	23.5	25.5	11
Mt. Airy, N. C.	25	25	14
Salisbury	25	25	13.5
Hickory	25	25	13.5
Wheeling, W. Va.	22.5	24.5	10
Hartford, Conn.	24.5	26.5	11.5
Bridgeport, Conn.	24	26	11.5
New London, Conn.	25.5	27.5	11.5
Dover, Del.	24.3	27	13
Wilmington, Del.	24.3	27	13
Augusta, Me.	25.5	27.5	12.5
Portland, Me.	25.5	27.5	12.5
Providence, R. I.	25.5	27.5	12.5
MIDDLE WEST			
Chicago	21	23	12
St. Louis	22.4	22.4	11.4
East St. Louis	22.5	22.5	11.5
Omaha, Neb.	24	24	12.7
Crawford, Neb.	25.5	25.5	14.2
Kansas City	22.3	22.3	10.8
Topeka	22.7	22.7	11.2
Wichita	22.7	22.7	11.2
Peoria, Ill.	23	23	12.5
Detroit	23.7	23.7	12.7
Bay City	23.8	23.8	12.8
Indianapolis	23	23	12.5
Ft. Wayne, Ind.	23	23	12.5
Minneapolis	24	24	12.5
Pipestone, Minn.	24.6	24.6	12.9
La Crosse, Wis.	22.5	23.9	12.9
Milwaukee	23.1	23.1	12.1
Madison, Wis.	23.2	23.2	12.2
Fargo, S. Dak.	26.1	26.1	14.3
Sioux City, Ia.	22.9	22.9	12
Des Moines, Ia.	23	23	11.7
Keokuk	22.9	22.9	11.6
Bismark	27.2	27.2	16.5
SOUTHERN POINTS			
Birmingham, Ala.	24.5	26.5	14
Mobile, Ala.	23	25	13
Fort Smith, Ark.	23.5	25.5	13.5
Little Rock, Ark.	24	26	12.5
Texarkana, Ark.	24.5	26.5	13.5
Louisville, Ky.	23.5	25.5	12.5
Bowling Green	25.5	27.5	13.5
Atlanta, Ga.	24.5	26.5	14
Augusta, Ga.	26.5	28.5	14
Savannah, Ga.	25.5	27.5	13
Houston, Tex.	23.5	25.5	14.5
Galveston, Texas	24	26	15
New Orleans	23	23	12
Nashville, Tenn.	23.5	26.5	13.5
Memphis, Tenn.	23	23	13
Tampa, Fla.	23.5	25.5	12
Ft. Myers	25.5	27.5	13
Jackson, Miss.	23	23	12.5
Natchez, Miss.	25	25	12.5
Charleston, S. C.	24.5	24.5	11.5
Columbia, S. C.	24.5	24.5	13.5
ROCKY MOUNTAINS			
Denver, Colo.	25.5	27.5	14.5
Glenwood Spgs., Col.	29.5	30.5	19
Pueblo, Col.	25.5	27.5	14.5
Casper, Wyo.	22.5	22.5	11.5
Basin, Wyo.	25	25	14.5
Cody, Wyo.	25.5	25.5	14.5
Lander, Wyo.	25	25	14.5
Cheyenne	25.5	27.5	14.5
Billings, Mont.	26.5	26.5	15.5
Butte, Mont.	28	28	17
Miles City, Mont.	28	28	17
Great Falls, Mont.	28	28	17
Salt Lake City	26	28	17
Ogden, Utah	26	28	17
Boise, Idaho	28.5	28.5	17.5
FAR WEST			
San Francisco	20.5	20 5	9.5
Los Angeles	20.5	20.5	10
Portland, Ore.	21.5	21.5	10.5
Seattle, Wash.	21.5	21.5	10.5
Spokane, Wash.	25	25	13.5
Tacoma, Wash.	21.5	21.5	10.5
SOUTH WEST			
Oklahoma City	23.5	24.5	13.5
Bartlesville, Okla.	23	23	12
Tulsa	23.5	25.5	13.5
Fort Worth	24.5	25.5	14.5
Shreveport	23.5	23.5	12.5

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¶The purpose of our new chilling plant which we have constructed at our laboratories is to demonstrate the Process when applied to a particular condition.

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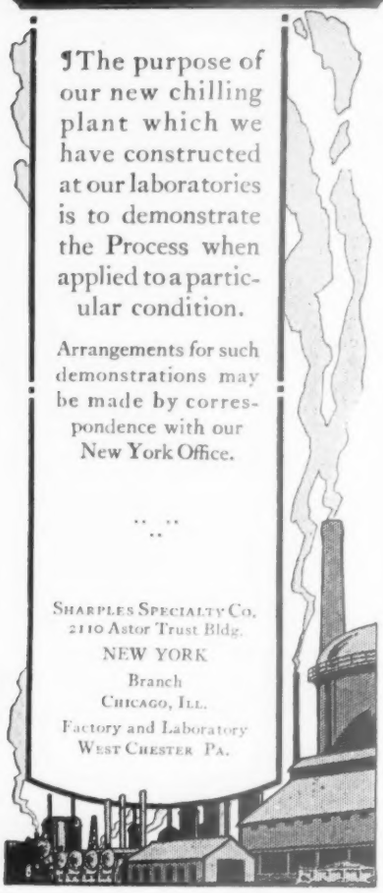

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Would Enroll Those Interested In Mexico

NEW YORK, Feb. 8.—The aim of the organizers of the National Association for the Protection of American Rights in Mexico is to make it a nation-wide organization by enrolling as associate members all individuals and companies in this country who are interested in the future development of Mexico. The association is an outgrowth of an informal organization of oil companies in this country owning and developing oil properties in Mexico. Frank J. Silsbee, formerly statistician with the oil division of the Fuel Administration, is secretary. Other executives have not been selected as yet. Active membership has been thrown open to individuals or companies who have some active property or business interests in Mexico. The associate membership fee is $1 a year.

A recent announcement from Secretary Silsbee along this line is as follows:

"The success of this association will manifestly be largely dependent upon the extent and character of its membership, which should be nation-wide; and in order that the largest possible number of members may be secured in the shortest possible time, it is urged that all those who are interested in the object and purposes of the association as above outlined and to whose attention this program may come immediately send their names and addresses, together with a statement of the particular nature of their connection with Mexico to Frank J. Silsbee, Secretary, at the temporary office of the association, Room No. 2800, 120 Broadway, New York City. A blank application for membership in the association, together with such further information as may be desired, will be furnished upon request.

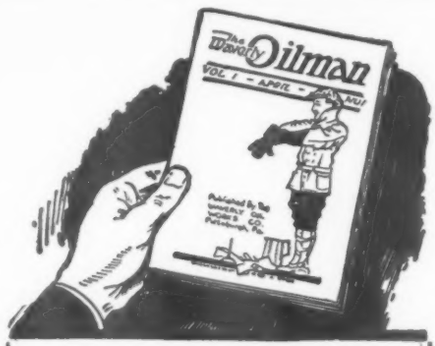
Foreign Opportunities

In the Commerce Report the past week, issued by the Bureau of Foreign and Domestic Commerce, the following trade opportunities, of interest to oil men seeking foreign markets, should prove of interest. In writing for further information, address the Bureau at Washington, D. C., and refer to the opportunity by the number given. Inquiry concerning each opportunity should be made on a separate sheet of paper:

28238—A man in Brazil desires to secure an agency for oils and greases, among other commodities. Quotations should be f. o. b. New York. Terms of payment, 60 days sight draft, documents attached. Correspondence may be in English. References.

28242—A commercial agent in Denmark desires to secure an agency for the sale of mineral oils and paraffin. Terms, cash against documents. Correspondence may be in English. References.

28257—A firm in Norway, among other commodities, desires to purchase quantities of iron pipe and piping. Terms, confirmed bank credit or payment against documents. Correspondence may be in English.



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OIL FINANCE

Liquidation Fails To Affect Oils

THE oil stocks maintained considerable strength last week on a market in which steel sold at its lowest price since the armistice was signed, and several factors appeared to focus attention on industrial and labor conditions in this country. In spite of this general liquidation oil stocks showed no price recessions for the week, a few issues even bettering their quotations in a small degree.

Adds To Feeling Of Uncertainty

Affecting the situation as a whole was the copper conference at Washington, where it was shown the dearth of domestic purchasing could not long allow production to be maintained at the present rate, and the announcement the government will undertake some method of scaling down commodity prices to induce domestic buying. Then, too, the business world heard of the putting up to Congress of a plan by which the railroad labor organizations would undertake to operate the railroads. All told, this lent in no small degree to the previously present feeling of uncertainty, and the wonder is the market did not behave worse.

Ohio Cities To Put Out More Stock

Ohio Cities Gas held firm despite the announcement of directors to sell $9,000,000 more in stock to allow for expansions. The stock sold off at first but soon made it up.

A cheering factor to oil securities late in the week was the announcement by the Standard Oil Company of New York of an increase in its regular dividend.

Midwest Refining was the strongest feature, advancing several points on the announcement from Washington that the oil land leasing bill is to be settled, and on terms more favorable to operators than had been anticipated in some quarters. Such a settlement would be expected to stimulate the development of the Wyoming fields.

Ohio Cities Gas Co. To Issue More Stock

The Ohio Cities Gas Company is planning to sell 367,500 additional shares of stock, par value $25, offering it to stockholders at par in the ratio of one new share for each four now held. The sale of this stock will add $9,187,500 to the company's working capital, which is to be used to expand the present working organization. It is understood, though unofficially, that a part of this sum will be used to acquire properties in Mexico and that its present holdings in the various Texas fields will be increased.

The company's outstanding capital at the end of its last fiscal year, March 31st was $36,750,000, on which it has been paying dividends at the rate of 20 per cent annually, $5 a share. The plan to sell additional stock to the amount of $9,187,500 would add $1,837,500 to its dividend requirements at the present rate of payment. Earnings for the year ending March 31, 1918, were $9,854,627, leaving a surplus of $3,425,620 after paying dividends. Earnings for the present year it is believed will allow for the continuance of dividends on the increased stock at the same rate. Operating expenses for the current year have been increased and profits from trolley lines the company owns have not been up to their previous standard. The company has been handling an increased business in oil, however, which has likely gone a good way toward making up the deficit coming thru other channels.

The Ohio Cities Gas Company is controlled by the Beman Dawes interests of Columbus, Ohio. It will be remembered the company became an active factor in the oil industry about two years ago thru the purchase of the properties and business of the Pure Oil Company, operating principally in the north central and eastern part of the country. It also purchased at that time several small refineries operating in the Mid-Continent field. It has also constructed a complete refinery in the Cabin Creek district of the West Virginia field, where it owns considerable production. Thru the Pure Oil Company it controls marketing outlets in Europe.

The Ohio Cities Gas Company's last annual statement issued March 31, 1918, showed quick assets of $14, 995,015 and current liabilities of $4,329,756, leaving working capital on that date of $10,665,259. The company had $4,293,398 in cash and U. S. government securities.

The annual meeting of the stockholders of the Midwest Refining Company will be held at the company's office, at Portland, Maine, Tuesday, March 4th. Three directors are to be elected.

Standard Of New York Increases Dividend

An indication of the confident belief the Standard Oil Company of New York holds as to the future of the oil industry is to be seen in its recent action in increasing its quarterly dividend from $3 to $4 a share. The first increased dividend will be payable March 15th to stock of record February 21st. The dividend paid three months ago was at the old rate of $3.

The company has paid $3 quarterly since June, 1917. The company lost a good share of its Far East trade during the war and its earnings suffered thru the "gasolineless" Sundays. It is believed when the peace terms are drawn and conditions begin to approach normal abroad again that this company will benefit largely in its export trade.

Confirms Increase Report

Official announcement is made by the directors of the Oklahoma Producing & Refining Company that they have determined to present at the annual meeting of stockholders a proposal to increase the authorized capital stock by $2,000,000, par value, and to offer this increased stock to the stockholders for subscription at par ($5) at the rate of one share of new stock to each five shares held.

The stockholders' list, for the purpose of subscription, is to be taken at the close of business, March 20, 1919, payment of subscriptions in full to be made April 10th. Assignable subscription warrants are to be issued.

In the January 22nd issue of NATIONAL PETROLEUM NEWS, it was announced that the Marland Refining Company, Ponca City, Okla., is offering a limited amount of its unissued capital stock for sale at $7 a share. It has developed that the Marland Company has no stock for sale, the stock mentioned being offered by Shapker, Waller & Company, 234 South La Salle street, Chicago.

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Dividends Exceeded Total Net Profits

The Eureka Pipe Line Company, according to its financial report for the year 1918, shows that dividends for the year were far in excess of net profits. The latter totaled $848,712, while the dividends amounted to $1,100,000, resulting in a deficit of $251,288. In the previous year the net profits were $1,111,883, and dividends totaled $1,200,003. The deficit was $88,120.

The balance sheet shows total assets of $12,008,368 for 1918, as compared with $12,032,113 for 1917. The net earnings for 1918 were equivalent to $16.97 a share, compared with $22.23 a share, earned in 1917, and $26.44 a share in 1916. Dividends last year amounted to $22, and at present the company is paying dividends at the rate of $20 a share per annum.

The company's property account shows an increase of close to $400,000, and that a substantial amount was charged off for depreciation. The decline in earnings has been due principally to heavier taxes and a considerable increase in operating expenses. The book value of the stock at the close of the year was $189 a share.

Cumberland Profits Greater Than In 1917

The financial report of the Cumberland Pipe Line Company for the year ending December 31, 1918, shows a profit for the year of $564,054, as compared with $487,758 for 1917. Dividends for 1918 totaled $179,990, an increase of $31,111 over 1917 dividends. The total surplus for 1918 amounted to $384,064.

The balance sheet as of December 31st shows assets totaling $3,396,496, as compared with total assets of $2,534,527 at the end of 1917.

The report shows that the earnings are equivalent to $37.03 a share for 1918, as compared on the same basis with $32.51 in the previous year, and $17.90 a share earned on $1,000,000 capital stock in 1916. Last year the company paid dividends of $12 a share.

The increase in the company's earnings has been due to the steady growth in its shipments from the Kentucky fields. The balance sheet shows that the company added about $1,000,000 to its plant account last year to take care of the increased production of this territory. In order to provide for these extensions to its pipe line system most of the earnings were turned back into the property.

The balance sheet also shows that the company's "other investments" have been eliminated and that cash has been largely increased apparently to take care of extensions now being made.

According to a report to the Bureau of Foreign Commerce by the consul general at Singapore, there were imported into the Straits Settlements in 1917 a total of 1,396,695 gallons of benzine, 984,423 gallons of lubricating oil, and 821,547 cases of petroleum. Compared with 1916, the report shows an increase in benzine imports of 395,070 gallons, a decrease of 453,629 gallons of lubricants and 596,965 cases of petroleum.

How Oil Shares Moved Last Week

	High 1918	Low 1918	No. Shares Sold	Price Feb. 1	Week's High	Week's Low	Price Feb. 8
NEW YORK STOCK MARKET							
Cal. Petroleum	24⅛	18¼	5,400	23⅛	24⅛	23⅛	23½
Mex. Petroleum	197¼	79	104,800	166½	170	165	166¼
Ohio Cities Gas	48	35⅛	71,900	38	41⅜	37	39¼
Okla. Prod. & Refg	10½	6¼	16,400	.....	8¼	8	8¼
Pierce Oil	19½	13	8,500	17½	17¾	16¾	16⅞
Royal Dutch	145	70	1,100	74	75¼	74	74⅜
Sinclair Oil Corporation	39	25½	7,600	35⅜	35⅛	33¾	34
Texas Co	203	136½	26,100	189¼	.....	.....	186½
Pan.-Amer. Pet. Co	74¼	40	16,100	67⅞	69¼	67	68½
Pan.-Amer. pfd	....	.....	400	.....	120	117	118
NEW YORK CURB MARKET							
Cosden & Co	8⅞	5⅞	9,600	7⅛	7⅞	6⅞	7
Cosden pfd	4¼	3½	800	.....	4⅛	4⅛	.....
Elk Basin Pet	7½	⅝	3,050	.....	6¼	6	.....
Federal Oil	4	1⅛	117,500	3	3⅝	2½	3¼
Glenrock Oil	....	3⅛	15,400	3⅝	4	3⅝	3⅞
Houston Oil	86½	39¼	3,600	.....	83	78½	81¼
Int. Petroleum	20¼	12¾	17,700	21⅛	22¾	20½	20¾
Island Oil & Trans	7⅛	1¾	30,000	.....	7¾	7⅜	7½
Merritt Oil Corp	29⅜	17½	15,900	.....	25	21½	23
Midwest Oil	$1.35	87c	68,500	.....	$1.50	$1.30	$1.40
Midwest Refg	140	97	13,900	.....	148½	130	145
Okmulgee Refg	11¼	1⅜	2,000	.....	2	1¾	.....
Sapulpa Refg	10¼	6¼	3,300	7	7⅜	7	7⅜
Sinclair Gulf	24½	15	7,400	24¼	25	24	24

STANDARD OIL GROUP.

Standard Oil securities are dealt with to only a small extent on the New York curb market, the great majority of sales being made over the counters of investment bankers. For this reason no record can be obtained of the total volume of sales from day to day to indicate the activity of any particular stock. Below are bid and asked quotations prevailing on the curb market at the close of business on the date given, the same quotations prevailing in the majority of unrecorded transactions:

	Feb. 8 Bid	Asked	1918 High	Low
Anglo-Amer	17	17½	1,050	884
Atlantic Refg	1,310	1,325	1,050	11¼
Buckeye Pipe Line	93	95	101	84
Cont. Oil Co	515	520	510	390
Galena Signal	90	92	148	83
National Transit	16½	17½	17	11½
Ohio Oil	323	327	365	289
Ill. Pipe Line	163	167	192	190
Penn. Mex	52	55	65	25
Prairie Oil & Gas	665	675	660	407
Prairie Pipe Line	270	273	305	240
South Penn. Oil	305	310	310	240

	Feb. 8 Bid	Asked	1918 High	Low
Solar Refg. Co	98	102	390	290
S. O. Calif	270	275	280	207
S. O. Indiana	760	770	760	525
S. O. Kansas	540	560	555	435
S. O. Kentucky	375	385	350	298
S. O. New York	324	327	333	255
S. O. New Jersey	688	693	710	495
S. O. Ohio	460	480	490	375
Vacuum Oil	415	420	420	312
Union Tank Line	114	116	110	82

MISCELLANEOUS STOCKS.

The following are bid and asked prices ruling at the close of business on the date given on the Cleveland and Pittsburgh stock markets, with the high and low marks reached during 1918:

	Bid	Asked	High	Low
Cities Service	314	317	323½	211½
Cities Ser. pfd	80½	80⅝	133	65¾
Paragon Refg	27¾	28¼	28	21¼
National Refg	182	200	203	170
National pfd	124	125	126	123
Lone Star Gas	170	175	197	95

Standard Of California Declares Extra Dividend

At a meeting of the board of directors of the Standard Oil Company of California, held January 28th, a regular quarterly dividend of $2.50 a share was declared, payable March 15th, to stockholders of record February 15th.

The directors also declared an extra dividend, equivalent to $2.50 per share, in Fourth Liberty Bonds at par value, payable March 15th to stockholders of record of February 15th. It is provided, however, that any dividend of less than $50 and dividend amounts in excess of $50, and of multiples thereof, will be paid in cash.

An extra dividend of 2½ per cent was paid in 4¼ per cent Liberty Bonds in September, 1918, but no extra was declared in December.

Shows Net Profits Of $295,723 For Year

The annual statement of the Southwest Pennsylvania Pipe Lines for the year ending December 31, 1918, shows profits totaling $295,723. Dividends to the amount of $419,999 were paid. The statement shows a falling off in the profits, as compared with the preceding year, the total for 1917 being $338,536.

Total assets, according to the statement, amounted to $5,534,367, an increase over the previous year of $68,641. Net earnings for 1918 were equivalent to $8.45 a share on the stock, compared with $9.67 earned in 1917, and $13.04 in 1916.

In connection with the report, however, the company states that its gathering charge was increased from 20 cents to 32 cents a barrel in August, 1918.

THE OIL INDUSTRY EXCHANGE

Get the habit of calling this Exchange when there is something you want.

Positions Wanted

GRADUATE CHEMIST — Experienced in mineral oils, fatty oils and greases, now oil inspector for Government, desires permanent position. Available March 1st. Address Box 68, care of NATIONAL PETROLEUM NEWS

If you are looking for help, why not insert your advertisement on this page, telling just what kind of a man you want. Wide-awake men are watching this page every week for opportunities.

Situations Open

A-1 GREASE MAN

wanted for the Canadian trade with experience in supplying cement plants, rolling mills, paper mills, etc.

Apply McColl Bros. Ltd., Toronto, Ontario

Large oil companies are always watching for experienced or promising men. Your advertisement on this page, telling your qualifications, experience, etc., would meet the eye of practically every man or company in the oil industry who is looking for help.

WANTED

A high-class man acquainted with the oil jobbing trade, to enter the wholesale department of one of the largest Eastern oil companies (with headquarters in New York), in connection with the sales of lubricating oils, petroleum specialties and grease. Apply in detail to

Box 65, Care of National Petroleum News

MEN OF ABILITY along every line of work connected with the petroleum industry are obtaining new and better positions by telling the readers of this paper just what they can do. If you are seeking an opening try a "position wanted" advertisement and then select the offer that appeals to you most.

Situations Open

Wanted—An Experienced Lubricating Oil Salesman

by an old established New England concern, one familiar with textile and other manufacturing trade for New England Territory, and possessing both knowledge of textile industry and mechanical engineering. State actual experience and salary expected. Correspondence strictly confidential.

Address Box 66
Care National Petroleum News

Position wanted advertisements cost but five cents per word. Minimum cost, one dollar, payable in advance.

Business Opportunities

MECHANICAL ENGINEER AND SALES EXECUTIVE

Specializing in Lubricating, Industrial and Fuel Oil Engineering. Experienced in development and study of possible markets; organization, instruction and engineering cooperation with sales department; preparation of clear-reading, forceful, technical advertisements and house bulletins; and in the general development of big business.

Well known to the Oil Trade; Associate Member of The American Society of Mechanical Engineers; graduate prominent engineering college. Nine years' experience under unusual conditions, with large refiners and oil marketers.

Correspondence or interview is solicited with an oil refiner who desires to develop a high-grade, up-to-date marketing organization in Pennsylvania, New Jersey, Delaware, Maryland or New York, which can meet and hold its own with severe competition.

Manufacturers of oil handling apparatus, fuel oil burning systems, lubricating systems, etc., can develop an extensive sale in this district.

Address Engineer
Care of National Petroleum News

Every oil man who "wants" something—whether it be a new job, a new employe, a partner, some piece of second-hand equipment, a buyer for his own equipment, or money to help him in his business—will look on this page for it. **Will he find your advertisement here?**

Wanted—Equipment

Saybolt Viscosimeter Wanted

Must be in first class condition. State price and particulars.

Box 67
Care of National Petroleum News

Have you any used equipment on hand which you are no longer using? Why not get rid of it now, by offering it for sale on this page?

For Sale

TANKS FOR SALE

400,000 Gallon Tank 36' dia. x 52' high—and many others of smaller capacity.

BOILERS, RAILS, SECOND-HAND PIPE, TUBES, ETC.

Perry, Buxton, Doane Co., Boston, Mass.

TANK CAR FOR SALE

One 8000 gallon tank car with heater coils, 50 ton truck, in good condition. Immediate delivery or can leave with leaser for five months at $125.00 per month.

Address N
Care of National Petroleum News

TANKS

23—18,000 bbl. to 55,000 bbl. Excellent. Immediate shipment. This is only part of our stock.

ZELNICKER in ST. LOUIS

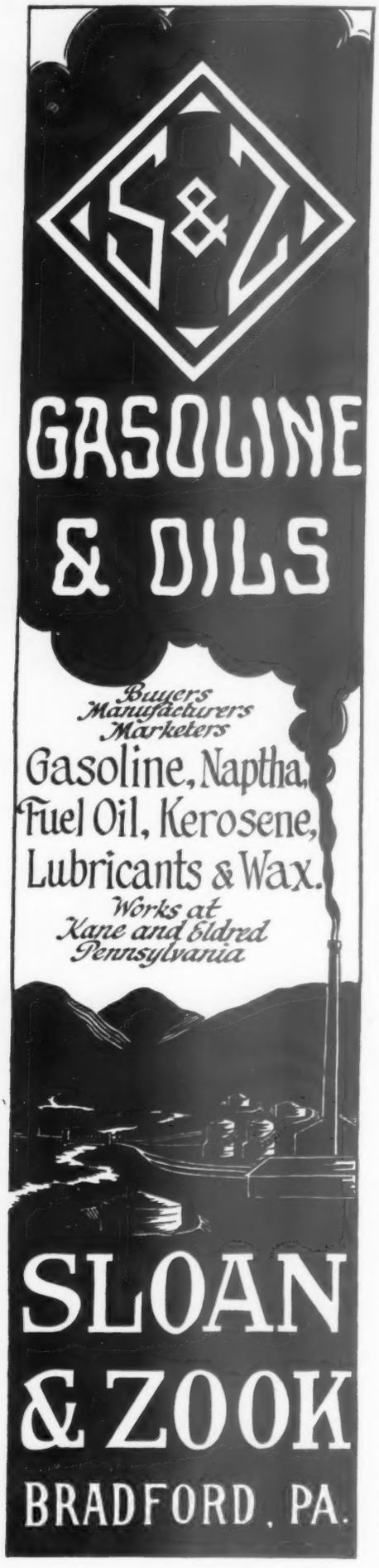
Send for Special 16 page Tank Bulletin 256 and General Bulletin 250 (100,000 Circ.) 88 pages.

Rails, Cars, Locomotives, Machinery, Piling

Many oil companies have on hand used equipment of all sorts which they would be glad to sell to you at a very low figure if they knew you wanted it. Why not tell them about it by putting an advertisement where they will look for it—on the Oil Industry Exchange page of NATIONAL PETROLEUM NEWS?

No matter what you "want," whether it is to buy or to sell, to secure a good man or get a better position The Oil Industry Exchange will connect you with the right party at a minimum expense.

WHAT IT COSTS—For "Help Wanted" or "Position Wanted" advertisements—5 cents per word. Minimum cost, $1.00. "Wanted—to Buy," "For Sale" and miscellaneous classified advertising—8 cents per word. Minimum cost, $2.00. Advertisements run in this column and set in special type or with border—$3.00 per column inch. No extra charge for copies of paper containing advertisements. Copy must reach us not later than Saturday preceding date of issue. All advertisements carried on this page are payable in advance.



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A copy will be sent free on request to any firm identified with the oil business.
Additional copies 50 cents each

WAVERLY OIL WORKS CO., Pittsburgh, U.S.A.

Wax Market Weak; Little Foreign Demand

By Special Correspondent

NEW YORK, Feb. 10.—The market for wax is rather weak at present, but little demand being reported from abroad for the 122-124 grade which figured in heavy shipments during the war period. The announcement of the lowering of the rates on British tonnage has caused considerable uncertainty, the exporting firms now awaiting to see if the rate on American bottoms is going to be lowered to meet or even better the British figure. In general the putting into effect of lower ocean rates, it is felt, will serve the purpose of stimulating the export business, even tho a period of uncertainty will exist until the rates are adjusted for a period of some length.

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